ARMED FORCES CHEMICAL JOURNAL

—U. S. Army Photo

MAY-JUNE, 1955

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ARMED FORCES CHEMICAL JOURNAL

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Editor
COL. JOHN C. MACARTHUR, USA (Ret.)
Associate Editor
COL. L. WILSON GREENE, Cml. C., USAR
Contributing Editors
DR. D. BRUCE DILL, DR. ROBERT L. FOX, MR. JOHN A. KLEY,
MR. IRVING PORETZ, MR. DANIEL F. REISENWEBER

COVER PHOTO

This rather striking picture taken at the Army Chemical Center, Md., shows, against a background of colored smoke, a rifle grenade with white phosphorus ready to "go". A color smoke grenade is used for signalling. Rifle grenades are used in situations where the range is greater than can be covered by the use of hand grenades.

The Armed Forces Chemical Journal is the official publication of the Armed Forces Chemical Association. The fact that an article appears in its columns does not indicate the approval of the views expressed in it by any group or any individual other than the author. It is our policy to print articles on subjects of interest in order to stimulate thought and promote discussion; this regardless of the fact that some or all of the opinions advanced may be at variance with those held by the Armed Forces Chemical Association, National Officers, and the Editors.

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A. F. C. A. ANNUAL MEETING

CLEVELAND JUNE 16-17

THE COMMITTEE ON Arrangements for A.F.C.A.'s 10th annual meeting, to be held at the Hotel Cleveland on June 16-17, calls upon all members who can come to attend, and urges all those who do plan to be present to make their hotel reservations *without delay*.

A block of rooms, single, double, and suites, has been set aside by the Hotel Cleveland, which will be the official headquarters for the Association's gathering this year.

A card announcement of the meeting has already been sent to all members. A detailed program, including a list of the speakers at the afternoon session on June 17 and the annual banquet that evening at the Hotel Cleveland, will be sent to the membership later.

Speakers List in Preparation

The speakers list has been under preparation for some time by President Prime, working in collaboration with the General Arrangements Committee headed by Mr. Glenn Hutt of Cleveland, vice president of the Ferro Corporation of Cleveland and also a vice president of A.F.C.A.

The speakers will consist of men of prominence in government or industry. A.F.C.A. headquarters promises an interesting and instructive program of speeches including the banquet address, but at this writing (middle of April) considers it most inadvisable to publish the list as it now stands. As everyone who has ever been concerned in advance arrangements for convention programs knows, changes, at least until near the date of the meeting, are inevitable due to conflict of dates or other causes. For that reason, it has been decided to make the announcement of the speakers by circular to the members and by a press release at a later date which will be well after the publication of this issue of the JOURNAL.

The speeches on the afternoon of June 17 this year will be in furtherance and continuation of the general meeting of the Association which will open at 10:00 A.M. There will be an adjournment at noon until 2:00 P.M., when the meeting will be resumed for the speeches which have been scheduled. This year the afternoon program will not, strictly speaking, be in the nature of a symposium devoted to a single subject or phase, but will consist of three or more addresses pertaining to national defense problems but otherwise not necessarily related.

New Chemical Corps Exhibit

As a special feature of this year's meeting it is expected to have an entirely new exhibit by the Chemical Corps of the Army. The display is being fabricated and is scheduled for its first showing at this A.F.C.A. meeting.

In accordance with the established practice of the Association to focus each of its annual meetings on some one of the three armed services, this year that service is the Army, represented particularly by the Chemical Corps. While the Association's interests embrace all three of the services, its foundation roots lie in the Chemical Corps and it is, therefore, considered appropriate this year to confine the service display to the Chemical Corps exhibit. The new exhibit will replace the one which was designed and manufactured after World War II and of which some parts are now out-of-date. The new exhibit is designed to point up the applications of Chemical Corps developments, particularly defensive equipment and procedures, as they affect directly the individual soldier and also the American family. Thus, the exhibit deals not only with the military application of toxic means of warfare but also with their bearing on Civil Defense equipment and procedures.

Time Table for the Meeting

Provisions of the two-day program, including a visit to Nela Park, the General Electric Company's establishment near Cleveland, the special entertainment planned for the ladies, and other features, were announced in the November-December issue of the JOURNAL. However, for the convenience of members, the detailed "time table" for the meeting is presented here. All gatherings, except as otherwise indicated, will be in the Hotel Cleveland.

Thursday, June 16

9:00 AM- 5:00 PM	Registration—Hotel Cleveland
9:30 AM- 6:00 PM	Chemical Corps Exhibit
9:00 AM-10:00 AM	Coffee Hour—Get Acquainted
10:00 AM-12 Noon	BUS TOUR—To include 2 Universities, Severance Hall, Art Museum, Residential Area
NOON—LUNCHEON	at Nela Park, General Electric Co. Program at Lighting Institute
4:00 PM	Return to Hotel Cleveland
8:00 PM-10:00 PM	A.F.C.A. Directors' Meeting (Closed)

Friday, June 17

9:00 AM- 5:00 PM	Registration—Hotel Cleveland
9:30 AM- 6:00 PM	Chemical Corps Exhibit
9:00 AM-10:00 AM	Coffee Hour—Get Acquainted
10:00 AM-12 Noon	GENERAL MEETING
2:00 PM- 4:30 PM	Speeches on National Defense *Presiding*—Admiral N. S. Prime
6:00 PM- 7:30 PM	RECEPTION AND COCKTAIL PARTY
7:30 PM	BANQUET *Presiding*—Admiral N. S. Prime

LADIES PROGRAM
Friday, June 17, 1955

9:00 AM-10:00 AM	Coffee Hour—Get Acquainted Shopping Tour—Cleveland Stores or Boat Trip—Lake Erie and Cuyahoga River
12 Noon	LUNCHEON (LOUNGE ROOM—HIGBEE COMPANY) Style Show Card Party
Friday Evening	Same as Men's Program

A. F. C. A. ACTIVITIES

ARMY CHEMICAL CENTER:

Contributes to Scholarship Fund

At a meeting of the officers and directors of the chapter on March 25 it was decided to hold a chapter cocktail party on May 12. Lt. Colonel A. W. Talbot was placed in charge of arrangements.

It was decided that the chapter would contribute $50.00 in the fund raising drive conducted by the Enlisted Specialists Club at the Army Chemical Center in support of its scholarship program.

Mr. David A. Rosenfeld, at the March meeting, was presented the A.F.C.A. plaque for meritorious service in recruiting new members.

CLEVELAND:

R. R. Cutler Is Made Company Vice-President

Mr. Robert R. Cutler, president of the Cleveland Chapter of the Armed Forces Chemical Association, who has been with the H. K. Ferguson Company, engineers and builders, since 1949, has been made vice-president of the Company and manager of its Central District Office.

Mr. Cutler, 47, a native of Belpre, Ohio, holds a B.A. degree from Marietta College and a Civil Engineering degree from Ohio State University. He served in the Navy in the Atlantic and European Theaters and is now a lieutenant commander in the Naval Reserve.

FT. McCLELLAN:

Hears Talks on Air Defense and Safari

Members of the Fort McClellan Chapter were entertained Thursday night, February 3, with a highly interesting talk by Commander Martin G. O'Neill, U.S. Navy, on duty with the 35th Air Defense Command at Dobbins Air Force Base, Marietta, Georgia.

Commander O'Neill's talk centered around the functions of the Continental Air Defense Command, including various types of warning systems.

He also applauded the work of the Civilian Defense agencies and stressed the need for an expansion of the existing Observation Post-network.

At the dinner meeting on March 3, held at Remington Hall, Mr. Marshall Hunter, President of the First National Bank of Anniston, introduced the speaker for the evening, Mr. John B. LaGarde, Anniston industrialist.

Mr. LaGarde enthralled his audience with an account of his hunting experiences on "Safari in Africa" which he illustrated with a film.

MIDWEST:

Plans Under Way For New Program

The annual election of chapter officers and a talk on "Petrochemicals in National Defense" were on the schedule of events for the April 20 meeting of the Midwest Chapter. Meanwhile, a tentative program for the next fiscal year has already been outlined. For this, there is definite provision for a symposium on "Electronic Computers in Industry" to be held in connection with the second International Automation Exposition, scheduled for November 14-17 in Chicago at the Navy Pier. A series of papers on engineering problems and other pertinent subjects is planned for this event which will be held November 16 or 17. It will be followed by a chapter dinner.

NEW ENGLAND:

Dr. MacCarthy of C.I.A. Talks on Intelligence

Dr. Shane MacCarthy, representing Mr. Allen Dulles, Director of the Central Intelligence Agency, spoke on the subject "Intelligence and Policy" at the mid-winter meeting of the New England Chapter held at the Hotel Somerset in Boston on March 3, 1955. In addition to the A.F.C.A. members other groups invited included the American Ordnance Association, the Armed Forces Communications Association, the Reserve Officers Association of Massachusetts, and seven Army and three Naval Reserve Units.

President Albert A. Brown of the chapter writes: "Dr. MacCarthy's forceful and convincing presentation was received with tremendous interest. . . . It was one of our most successful meetings. . . ."

Left to right: Col. A. A. Brown, chapter president; Dr. Shane MacCarthy, guest speaker; Col. Chenery Salmon; and Mr. Harry A. Wansker, chapter member.

—U.S. Army photo

NEW CUMBERLAND:

Major Bearden to Receive Plaque

Mrs. Lois E. Randolph, secretary-treasurer of the recently organized A.F.C.A. Chapter at the New Cumberland General Depot, New Cumberland, Pa., writes that the chapter is having its charter duly framed. She states that the chapter looks forward with pleasure to the receipt by Major Alva G. Bearden, chapter president, of an A.F.C.A. plaque in recognition of his good work in sponsoring new members of the Association. Plans are in process for an early meeting of the chapter.

PURDUE: Election of Officers

The Purdue University Chapter at a recent meeting elected officers for the current year, commencing in March, as follows: Mr. Manuel L. Sanches, president; Mr. Gary Elmer, vice-president; Mr. Richard Stephans, secretary; and Mr. William Hankins, treasurer. The chapter was recently organized with 32 charter members and has now added two additional members to its rolls.

SAN FRANCISCO: Gen. Creasy Speaks: Schrier, New President

San Francisco Chapter reports a most successful meeting held at the Officers' Club of the Presidio on February 16 when Major General William M. Creasy, Army Chief Chemical Officer, was the guest speaker. His subject was mobilization of the chemical industry. More than 100 members and guests were present.

During his visit General Creasy was also guest at a luncheon at the University Club given by Mr. M. H. Scott.

Chapter officers elected for the new year are: Mr. Elliott Schrier, president; Mr. Leland A. Doan, vice-president (Programs); Mr. Patrick J. Moran, vice-president (Membership); and Mr. E. W. Eipper, secretary-treasurer.

WASHINGTON:

Luncheon During Chemical Progress Week

Dr. W. T. Read, president of the chapter, has announced that a luncheon to be given jointly with the Engineers Club of Washington will be held at the National Airport on May 16, during the Chemical Progress Week.

Major General Charles E. Loucks, Deputy Chief of the Chemical Corps, who is slated for retirement on May 31, will be the guest of honor. It was expected that there would be a large turnout both of industrial and military members of the chapter for this spring gathering.

WILMINGTON: Retirement of Dr. W. E. Lawson

Plans of the Wilmington Chapter for its spring meeting on March 31 provided for a talk on civil defense by Colonel D. Preston Lee, Delaware State CD Director.

In a notice to its members of this meeting, the chapter also referred to the forthcoming retirement of Dr. Walter E. Lawson of the Development Department, Du Pont Company. Dr. Lawson, past president of both the National Association and the Wilmington Chapter, plans to move from Wilmington during the summer to his residence at Moon, Virginia. Since it seemed this meeting would probably be the last one he would attend as a resident of Wilmington, it was planned to include in this program an appropriate ceremony in recognition of Dr. Lawson's distinguished career and service to the Association.

DR. GUSTAV EGLOFF

Dr. Gustav Egloff, internationally known chemical scientist and engineer, died in a hospital in Chicago on April 29, 1955 following a very brief illness.

Dr. Egloff was born in New York City on November 10, 1886. He was research director of the Universal Oil Products Company, Des Plaines, Illinois and was a Director-at-Large of the Armed Forces Chemical Association. The funeral was held at Yonkers, New York May 3, 1955.

DEPUTY TO ASSISTANT SECRETARY OF THE ARMY

—U.S. Army photo

Mr. Henry N. Marsh being sworn in as Deputy to Assistant Secretary of the Army by Mr. Emanuel M. Colman, Chief, Employee Utilization Office, Secretary of the Army, while Mr. Frank H. Higgins, Assistant Secretary, looks on.

Mr. Henry N. Marsh of Wilmington, Delaware, smokeless powder consultant to the Explosive Department of Hercules Powder Company of Wilmington, and past president of the Wilmington Chapter of the A.F.C.A., has been appointed as Deputy to the Assistant Secretary of the Army Frank H. Higgins.

Mr. Marsh has been granted a year's leave of absence from his firm to accept this appointment. His specific assignment is Logistics and Research and Development.

In 1950 Mr. Marsh served as consultant to the Secretary of Defense for a survey of powder production capacities in NATO countries, and has since served on a number of consultative assignments with U.S. Government agencies.

He was born in Maysville, Kentucky in 1893; graduated from the University of Kentucky cum laude with a B.S. degree in Industrial Chemistry in 1914.

ARMED FORCES DAY—MAY 21

Armed Forces Day this year will be celebrated on May 21.

The slogan for the celebration, which will be marked by interesting open house programs and demonstrations at posts, camps and stations of all the Armed Forces, is "Power for Peace."

A proclamation announcing Armed Forces Day has been issued by President Eisenhower.

Armed Forces Day is designed to give Americans and the peoples in friendly countries a better understanding of the personnel, equipment and working relationship of the various components of the Armed Forces. The open house programs will feature exhibits, exercises, demonstrations, parades, drills, awards ceremonies, vessels in port, sports events, dances, special film showings, and other similar activities the Defense Department announces.

DR. W. E. LAWSON TO RETIRE FROM DU PONT

Dr. Walter E. Lawson, past president of the A.F.C.A. and president of the Association's Commission on Technical Manpower, will retire at the end of May from his position with the Du Pont Company with which he has been associated for 30 years.

Dr. Lawson received the Presidential Certificate of Merit in 1948 in recognition of services rendered the Armed Forces overseas.

Dr. Lawson was born December 12, 1892, at Dunlap, S.D. He received a B.S. degree in 1917 and a M.S. degree in 1922 from the University of Washington and in 1925 he received the degree of Ph.D. from Johns Hopkins University.

He entered the Marine Corps in World War I and is a veteran of expeditionary duty with the 15th Regiment in Santo Domingo. He resigned his commission in 1920 to return to his civilian career. From 1921 to 1925 he was engaged in biochemical research in the Chemical Warfare Service and it was during that year that he joined the Du Pont Company. He became assistant director in charge of research in the Explosive Department and later joined the Development Department. Dr. Lawson is a consultant of the Chemical Corps of the Army and other defense agencies of the government.

Dr. Lawson's hobbies are aviation and fishing. He plans on retiring to reside at "Lawson's Landing," Moon, Virginia.

GEN. LOUCKS RETIRING

Major General Charles Ernest Loucks, Deputy Chief Chemical Officer, will retire from active duty on May 31 following 32 years service, including duty with the Chemical Warfare Branch since 1925.

General Loucks was awarded the Distinguished Service Medal for services during the war. He was promoted to brigadier general in 1950 and was made a major general in 1954 (see the September-October 1954 issue of the JOURNAL). He holds a Bachelor's degree from Leland Stanford University and a Master's degree from the Massachusetts Institute of Technology. Born in California on June 29, 1895, General Loucks expects to return eventually to his native state but as yet has made no definite plans for the future.

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DISSATISFACTION CAN MEAN *PROGRESS*

By MAJOR GENERAL WILLIAM M. CREASY
Chief Chemical Officer, Department of the Army

SOME TIME ago I took part in a round-table discussion in Boston. My subject concerned the type of engineers the Chemical Corps had a need for, and what we expected from such men.

The end result of the discussion was of the general tenor that we want men who are "dissatisfied." Not dissatisfied in the common sense, that is about their pay, working conditions, and things in general—but men who are not wholly satisfied with the results of their work; men who feel that many individual projects they have worked on might be further improved. Such a feeling in a man is good, for from such lack of contentment with his efforts comes progress.

While it is true that, if necessary, the Chemical Corps could hold its own if international combat again engulfed the world, we are not entirely satisfied with our position. We are dissatisfied in that we feel we are not operating with the maximum efficiency and flexibility that is possible. We are not completely satisfied in our own minds that we are properly geared to meet, as quickly and efficiently as we probably could, all the challenges that international conditions could present. We are not satisfied that we are utilizing the brains and experience of civilian industry—our partners in the military-civilian defense team—to the maximum extent possible, nor are we entirely satisfied that we are using our own personnel in the proper manner to exploit the individuals' talents to the fullest. We are not satisfied that we have given the general public as much information about CBR warfare as is required to make an intelligent appraisal of its potentialities.

HOWEVER, to a considerable degree, we must remain unsatisfied. For the day when we reach the point where we sit back and say "we're satisfied" that we have accomplished all of these things, will be the day that we will start losing the international race for CBR warfare superiority. On the other hand, we cannot sit back now and consider this lack of satisfaction as a normal situation and not attempt to do anything about it. Such a complacency could be deadly.

What, then, is the Corps doing about the situation?

We feel that, to a certain extent, the crux of the whole situation lies in civilian industry; that by bringing the ingenuity and know-how of industry more and more into the military picture, our advancement will be faster and greater. Not so many years ago, for a military man to admit that industry and science could play an important part in his organization would have been the next thing to heresy.

Today, however, it is a realized fact. World War II brought a realization that science and industry now play such an important part in combat that the general in the field would be helpless without their aid; for all the astute tactics of the military mind will be of nought if the troops do not have the superiority in weapons necessary to successfully carry out those tactics.

The military must be receptive to the aid, advice, guidance, and material help it requests from industry. It must be in a position to put these things into the proper channel of utilization as they are received. In short, we must put our own affairs in order and in such a state that those ideas and material things we get from industry can be used to the fullest advantage.

To this end, the Chemical Corps needs a thorough and objective scrutinization. Our overall operations, and more particularly the concepts underlying them, must be reviewed critically and objectively. From this review a general realignment of the Corps may be necessary so that it will be more responsive to our changing responsibilities. We must have a vitalized organization that is flexible enough to meet any and all challenges thrown our way by changing world conditions. We must have a Chemical Corps that can use to the fullest extent every idea or item that enlists the aid of chemical or biological energy into the military program. It would be most foolish and foolhardy not to exploit every such possibility, for if we don't, the potential enemies surely will.

THERE have been many studies made of the Chemical Corps during its 37 years of existence, but all have been limited in scope, or pertaining only to particular phases of our work. Today, however, such an overall study as I have described above, is being made of the Corps by an "Ad Hoc Advisory Committee on the Chemical Corps Mission and Structure." The men who compose this Committee are comparatively young business leaders—all under the age of 50—who are still "on the way up" in their respective fields, and can give the study a fresh and young approach. All have had some contact with the Corps in the past, but not enough so that their overall impartial picture of the Corps will be dimmed by too much knowledge of our operations.

This Committee is composed of: Mr. Otto N. Miller, Chairman, a vice-president of the Standard Oil Company of California; Mr. Hans A. Klagsbrunn, the senior member of the law firm of Klagsbrunn, Hanes, and Irwin, and the Washington, D.C., counsel for the Olin-Mathieson Chemical Corporation; Dr. James A. Shannon, Associate Director of the National Institutes of Health; and Mr. George H. Watkins, University of Chicago Vice-president.

Left to Right: Dr. James A. Shannon, Associate Director of the National Institutes of Health; Otto N. Miller, a vice-president of the Standard Oil Company of California, committee chairman; Major General Creasy; Hans A. Klagsbrunn, senior member of the Washington, D.C. law firm of Klagsbrunn, Hanes and Irwin, and the Washington counsel for the Olin-Mathieson Chemical Corporation; and George H. Watkins, vice-president of the University of Chicago.

To serve as associate (non-voting) members of the Committee, and as advisors and special assistants to the above four men, I have appointed: Colonel William J. Allen, Jr., Commanding Officer of the Chemical Corps Engineering Agency at the Army Chemical Center; Colonel Robert W. Breaks, Commanding Officer of Pine Bluff Arsenal; Dr. John Schwab, Technical Director for Operations, Camp Detrick; Mr. Robert A. Bergseth, Chief of the Procurement Branch, Materiel Division; and Mr. Delbert H. Flint, Assistant Chief of the Plans, Training, and Intelligence Division, of the Washington headquarters staff. Lt. Colonel Robert K. Nelson of the Program Coordinating Office, also of the Washington staff, is serving as the Executive Secretary of the Committee.

The purpose of the Ad Hoc committee is to study and evaluate the current mission assignment of the Chemical Corps and its existing organizational structure and the relationships between the various agencies; to make recommendations as to whether our mission should be expanded or contracted, and for the optimum organization structure within which the Chemical Corps can most effectively accomplish its mission.

Obviously, the stated purpose of the committee is somewhat broad and vague. This was done so that the door would be open to the committee for study in any area in which it sees fit to delve. However, in order to give it something basic on which to start its study, I have asked for recommendations on six specific questions:

1. Is the Corps doing too much, or not enough?
2. Should the Corps have troops of its own?
3. Should we expand our contractual relations with industrial, scientific, and educational institutions?
4. Have all operational functions been delegated to the field commands?
5. Is the best possible use being made of scientists and engineers as well as key military and civilian personnel?
6. Is our organization responsive to requirements of financial management?

With these questions in mind, and with others of their own, the Committee held its first organizational meeting at the Dugway Proving Grounds in Utah, on the 11th and 12th of March. Since then the members have been touring the Corps' various installations and agencies, talking with our people, studying our operations, looking at the relationships between various agencies with a critical eye—and keeping their thoughts to themselves. Just what their recommendations will be when they submit their report in a few months, I do not know. But I feel that for the first time in its history, the Corps will have undergone the most thorough scrutinization possible with a view toward making it a more efficient and flexible organization.

The idea that the Corps can benefit from the "know-how" possessed by the non-military mind is not new. The Corps relies heavily on the advice of the Chemical Corps Advisory Council, formed in 1946, which is composed of outstanding men of science, industry and engineering. The members of this Council, either individually or collectively, advise the Corps on the scientific and technical aspects of research, development and engineering activities and have contributed immeasurably to the Corps' progress in these fields.

We have the American Chemical Society Committee Advisory to the Chemical Corps, which dates from 1921. Known then as the "Committee for Cooperation with the Chemical Warfare Service," it worked with the Corps until 1942, when the National Defense Research Committee was formed and assumed the duties previously performed by the ACS Committee. After the end of World War II, the ACS again formed a committee to work with us, under its present name. This committee advises the Chief Chemical Officer on professional status of personnel, public relations problems, industrial relations, and research policies.

Steps are now under way for the formation of a committee that can help us in the biological field, and by the time this sees print, the major scientific society which will sponsor the committee may have formalized its plans.

And, thanks to the work of the Armed Forces Chemical Association's president, Admiral Nathaniel S. Prime, another committee is being formed to aid us in the industrial field.

With the approval of the Department of Army, the Corps recently asked the aid of the A.F.C.A. in the formation of a group that will be known as the Chemical Corps Industry Advisory Council. The response of the industrial membership of the Association to a questionnaire regarding the formation of such a group was such that we should have little trouble finding the approximately 30 members who will make up the Council.

In general, the members of the Council will be drawn from executives of industrial and educational organizations, and government agencies, whose experience and training are related directly to one or more of the following fields of interest, all of which are necessary in the accomplishment of the Chemical Corps mission: Organization and Management; Process Engineering and Manufacturing in the chemical, biological, radiological and incendiary fields; Purchasing and Industrial Mobilization Planning; Inspection; Materiel Handling and Storage; Materiel Components in the metals, plastics, oil, and rubber fields; Instrumentation and Meterology; Cost Accounting and Legal. The advice of the Council will be sought on definite problems arising in our manufacturing activities and relating to these fields.

The work of such advisory groups as these not only will serve to quell some of our "dissatisfaction" with the pace of our work but they also will aid in creating an environment under which the Corps can form the dynamic type of organization and formulate the type of policies which it must have effectively to discharge its responsibilities. They also can help to create an environment which will permit wider dissemination of information needed to dispel public misunderstanding and confused thinking regarding the proper role of CBR in national defense planning; an environment which will permit the removal of handicaps which have deterred the full development of CBR potentialities.

These groups are composed of highly enlightened leaders whose influence on public thought is widely felt. In addition to their invaluable technical and scientific counsel, they can contribute toward greater public understanding and acceptance of the Corps' mission and programs because of the weight which their word carries with others.

The A.F.C.A. has done much to help us in creating better public understanding of CBR, but we have just barely scratched the surface. Our work must be intensified in this field, and that is one reason why I am making it a special point to visit as many of the A.F.C.A.'s local chapters as possible. Advertising men know that endorsement of their product is the best form of advertising they can get. So it is, too, with the Chemical Corps' "product." And when the individual members of the A.F.C.A. pass on to their friends and business associates some of the things they learn from the appearance of Chemical Corps officers at their chapter meetings, they aid greatly in boosting our national defense effort . . . and aid the Corps in another of the areas in which it is not content.

Today, through the aid of industry and business, the Chemical Corps stands upon a new threshold of achievement. We have much to learn from industry in the areas

(Continued on Page 11)

DISSATISFACTION CAN MEAN *PROGRESS*

By MAJOR GENERAL WILLIAM M. CREASY
Chief Chemical Officer, Department of the Army

SOME TIME ago I took part in a round-table discussion in Boston. My subject concerned the type of engineers the Chemical Corps had a need for, and what we expected from such men.

The end result of the discussion was of the general tenor that we want men who are "dissatisfied." Not dissatisfied in the common sense, that is about their pay, working conditions, and things in general—but men who are not wholly satisfied with the results of their work; men who feel that many individual projects they have worked on might be further improved. Such a feeling in a man is good, for from such lack of contentment with his efforts comes progress.

While it is true that, if necessary, the Chemical Corps could hold its own if international combat again engulfed the world, we are not entirely satisfied with our position. We are dissatisfied in that we feel we are not operating with the maximum efficiency and flexibility that is possible. We are not completely satisfied in our own minds that we are properly geared to meet, as quickly and efficiently as we probably could, all the challenges that international conditions could present. We are not satisfied that we are utilizing the brains and experience of civilian industry—our partners in the military-civilian defense team—to the maximum extent possible, nor are we entirely satisfied that we are using our own personnel in the proper manner to exploit the individuals' talents to the fullest. We are not satisfied that we have given the general public as much information about CBR warfare as is required to make an intelligent appraisal of its potentialities.

HOWEVER, to a considerable degree, we must remain unsatisfied. For the day when we reach the point where we sit back and say "we're satisfied" that we have accomplished all of these things, will be the day that we will start losing the international race for CBR warfare superiority. On the other hand, we cannot sit back now and consider this lack of satisfaction as a normal situation and not attempt to do anything about it. Such a complacency could be deadly.

What, then, is the Corps doing about the situation?

We feel that, to a certain extent, the crux of the whole situation lies in civilian industry; that by bringing the ingenuity and know-how of industry more and more into the military picture, our advancement will be faster and greater. Not so many years ago, for a military man to admit that industry and science could play an important part in his organization would have been the next thing to heresy.

Today, however, it is a realized fact. World War II brought a realization that science and industry now play such an important part in combat that the general in the field would be helpless without their aid; for all the astute tactics of the military mind will be of nought if the troops do not have the superiority in weapons necessary to successfully carry out those tactics.

The military must be receptive to the aid, advice, guidance, and material help it requests from industry. It must be in a position to put these things into the proper channel of utilization as they are received. In short, we must put our own affairs in order and in such a state that those ideas and material things we get from industry can be used to the fullest advantage.

To this end, the Chemical Corps needs a thorough and objective scrutinization. Our overall operations, and more particularly the concepts underlying them, must be reviewed critically and objectively. From this review a general realignment of the Corps may be necessary so that it will be more responsive to our changing responsibilities. We must have a vitalized organization that is flexible enough to meet any and all challenges thrown our way by changing world conditions. We must have a Chemical Corps that can use to the fullest extent every idea or item that enlists the aid of chemical or biological energy into the military program. It would be most foolish and foolhardy not to exploit every such possibility, for if we don't, the potential enemies surely will.

THERE have been many studies made of the Chemical Corps during its 37 years of existence, but all have been limited in scope, or pertaining only to particular phases of our work. Today, however, such an overall study as I have described above, is being made of the Corps by an "Ad Hoc Advisory Committee on the Chemical Corps Mission and Structure." The men who compose this Committee are comparatively young business leaders—all under the age of 50—who are still "on the way up" in their respective fields, and can give the study a fresh and young approach. All have had some contact with the Corps in the past, but not enough so that their overall impartial picture of the Corps will be dimmed by too much knowledge of our operations.

This Committee is composed of: Mr. Otto N. Miller, Chairman, a vice-president of the Standard Oil Company of California; Mr. Hans A. Klagsbrunn, the senior member of the law firm of Klagsbrunn, Hanes, and Irwin, and the Washington, D.C., counsel for the Olin-Mathieson Chemical Corporation; Dr. James A. Shannon, Associate Director of the National Institutes of Health; and Mr. George H. Watkins, University of Chicago Vice-president.

Left to Right: Dr. James A. Shannon, Associate Director of the National Institutes of Health; Otto N. Miller, a vice-president of the Standard Oil Company of California, committee chairman; Major General Creasy; Hans A. Klagsbrunn, senior member of the Washington, D.C. law firm of Klagsbrunn, Hanes and Irwin, and the Washington counsel for the Olin-Mathieson Chemical Corporation; and George H. Watkins, vice-president of the University of Chicago.

To serve as associate (non-voting) members of the Committee, and as advisors and special assistants to the above four men, I have appointed: Colonel William J. Allen, Jr., Commanding Officer of the Chemical Corps Engineering Agency at the Army Chemical Center; Colonel Robert W. Breaks, Commanding Officer of Pine Bluff Arsenal; Dr. John Schwab, Technical Director for Operations, Camp Detrick; Mr. Robert A. Bergseth, Chief of the Procurement Branch, Materiel Division; and Mr. Delbert H. Flint, Assistant Chief of the Plans, Training, and Intelligence Division, of the Washington headquarters staff. Lt. Colonel Robert K. Nelson of the Program Coordinating Office, also of the Washington staff, is serving as the Executive Secretary of the Committee.

The purpose of the Ad Hoc committee is to study and evaluate the current mission assignment of the Chemical Corps and its existing organizational structure and the relationships between the various agencies; to make recommendations as to whether our mission should be expanded or contracted, and for the optimum organization structure within which the Chemical Corps can most effectively accomplish its mission.

Obviously, the stated purpose of the committee is somewhat broad and vague. This was done so that the door would be open to the committee for study in any area in which it sees fit to delve. However, in order to give it something basic on which to start its study, I have asked for recommendations on six specific questions:

1. Is the Corps doing too much, or not enough?
2. Should the Corps have troops of its own?
3. Should we expand our contractual relations with industrial, scientific, and educational institutions?
4. Have all operational functions been delegated to the field commands?
5. Is the best possible use being made of scientists and engineers as well as key military and civilian personnel?
6. Is our organization responsive to requirements of financial management?

With these questions in mind, and with others of their own, the Committee held its first organizational meeting at the Dugway Proving Grounds in Utah, on the 11th and 12th of March. Since then the members have been touring the Corps' various installations and agencies, talking with our people, studying our operations, looking at the relationships between various agencies with a critical eye—and keeping their thoughts to themselves. Just what their recommendations will be when they submit their report in a few months, I do not know. But I feel that for the first time in its history, the Corps will have undergone the most thorough scrutinization possible with a view toward making it a more efficient and flexible organization.

The idea that the Corps can benefit from the "know-how" possessed by the non-military mind is not new. The Corps relies heavily on the advice of the Chemical Corps Advisory Council, formed in 1946, which is composed of outstanding men of science, industry and engineering. The members of this Council, either individually or collectively, advise the Corps on the scientific and technical aspects of research, development and engineering activities and have contributed immeasurably to the Corps' progress in these fields.

We have the American Chemical Society Committee Advisory to the Chemical Corps, which dates from 1921. Known then as the "Committee for Cooperation with the Chemical Warfare Service," it worked with the Corps until 1942, when the National Defense Research Committee was formed and assumed the duties previously performed by the ACS Committee. After the end of World War II, the ACS again formed a committee to work with us, under its present name. This committee advises the Chief Chemical Officer on professional status of personnel, public relations problems, industrial relations, and research policies.

Steps are now under way for the formation of a committee that can help us in the biological field, and by the time this sees print, the major scientific society which will sponsor the committee may have formalized its plans.

And, thanks to the work of the Armed Forces Chemical Association's president, Admiral Nathaniel S. Prime, another committee is being formed to aid us in the industrial field.

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Obituaries

DR. ALLAN P. COLBURN

Dr. Allan P. Colburn, distinguished chemical engineer and educator, Provost of the University of Delaware and, since 1952, chairman of the Chemical Corps Advisory Council died on February 6, 1955.

Dr. Colburn was born June 8, 1904, in Madison, Wis. He attended the University of Wisconsin in his native city and received his B.S., M.S., and Ph.D. degrees from that institution. He was a research engineer with the E. I. duPont de Nemours & Co., Inc. from 1928 to 1938 when he became an associate professor of chemical engineering at the University of Delaware. He was professor and chairman of the department, 1941-47; assistant to the president and adviser on research, 1947-1950, acting president, 1950, and PROVOST, 1950-1955. He served as Adviser of the National Science Foundation in 1954 and it was also in that year that he received from the U.S. Government the Meritorious Civilian Award for his outstanding contributions to the National Defense programs. The presentation was made by Maj. General E. F. Bullene, then Chief Chemical Officer of the Army.

Recipient of various other honors for scientific achievement, Dr. Colburn was a member of the American Association for the Advancement of Science, the American Chemical Society, the Institute of Chemical Engineering, the Society of Mechanical Engineering, the Society of Engineering Education, and the Armed Forces Chemical Association.

MR. RAYMOND DEUTSCH

Mr. Raymond Deutsch, founder and president of the Monarch Aluminum Manufacturing Co., Cleveland, O., one of the group member companies of the Armed Forces Chemical Association, died at Boca Raton, Florida, on February 27, 1955.

Mr. Deutsch organized one of the first commercial aluminum foundaries in the United States, and under his active leadership his company became one of the world's largest manufacturers of cast aluminum cooking utensils. He was vice-president of the Aluminum Association and had been active in the Aluminum Wares Association and other trade groups.

He was a member of the Rotary Club of Cleveland, the American Society for Metals, the Cleveland Chamber of Commerce, and the American Ordnance Association. He is survived by his wife, a sister, two daughters and three grandchildren.

MR. EDWARD C. EATON

Mr. Edward C. Eaton, chairman of the Membership Committee of the Midwest Chapter of A.F.C.A., died at St. Luke's Hospital, Chicago, on February 21, 1955.

Mr. Eaton was Supervisory Chemical Inspector of the Chicago Chemical Procurement District of the Chemical Corps. He was born in Chicago on May 12, 1907 and attended the University of Chicago where he received a B.S. degree. He also studied explosives chemistry at the Illinois Institute of Technology. During World War II he served as Chemical Inspector for the Chicago Chemical Procurement District. After the war he was engaged for several years in industry, returning to service with the Chemical Corps in 1951. His energetic membership work for A.F.C.A. brought him many friends both in the Chemical Corps and in Midwest industrial circles.

DR. MACY HONORED

In connection with the Centennial Celebration of the College of Engineering of New York University, citations were conferred on one hundred alumni whose achievements have brought distinction to themselves and to the University.

Dr. Rudolph Macy, Chief of the Chemical Division, Chemical and Radiological Laboratories, Army Chemical Center, Md., was one of the alumni to receive this honor. He was graduated from New York University in 1920; the following year appointed Inman Fellow at the University and awarded the Master of Science degree, and in 1923 he received the degree of Doctor of Philosophy in Physical Chemistry.

From 1923 to 1927 Dr. Macy taught chemistry at the University of Maine. For his last two years there he was Assistant Professor. Since 1927 he has been employed at the Army Chemical Center.

Dr. Macy is the author of a book, "Organic Chemistry Simplified" (Chemical Publishing Co., Brooklyn, N.Y.) and 17 articles in chemical journals and in a chemical encyclopedia. Two patents have been granted to him.

BOOK BY COLONEL RIEGELMAN

Caves of Biak by Colonel Harold Riegelman, USAR (Ret.) (Dial Press, Inc., New York, N.Y., price $4.00) was placed on sale on April 12. Colonel Riegelman is well known in the Chemical Corps which he entered in World War I. He was very active in the Reserve for twenty years and after call to active duty in World War II he served as Chemical Officer of the I Corps in the Southwest Pacific campaigns.

After reading Caves of Biak, Major General William M. Creasy commented, "Here for the first time in the history of the chemical warfare is a nontechnical, popular account of the use of chemicals in battle—flame throwers, smoke, mortars, and grenades."

Told in the author's own vivid language, Caves of Biak is a lively collection of his personal experiences in four Southwest Pacific campaigns extending from Australia through New Guinea and the Philippines, to Japan. It covers his candid observations of the campaigns themselves, well interspersed with interesting details of the various countries and the natives therein. Caves of Biak has many anecdotes of the Chemical Corps' officers who served with Colonel Riegelman in the Southwest Pacific and is a worthwhile addition to your library.—H.A.K.

MUCH MORE THAN MEETS THE EYE GOES INTO DOW PACKAGE DESIGN

Engineers and ocular cameras, salesmen, lawyers and artists combine talents to produce a unified "sales team" for Dow

Tin cans and tank cars, cardboard cartons and fiber drums, bags and bottles of sundry shapes, carry Dow products to world markets. In addition to quickly describing its contents, each package should speak for the product's quality and should reflect the company which produced it. Dow recently redesigned its packages with these objectives in mind.

Developing effective design while maintaining family resemblance for hundreds of Dow products was not an easy task. The abilities of hundreds of people and many machines were involved. Designers, engineers, salesmen, lawyers and artists all were called upon to contribute their particular knowledge.

An ocular camera played a vital role in choice of design. A subject sits before the camera and the test package is briefly exposed. Meanwhile, a moving picture is made of the subject's eyes. The picture is printed and played back, giving an accurate record of how the package was scanned. When analyzed, these pictures show which design elements dominated, the order in which the product message was read and so forth. The result—an accurate test of whether the package is doing its job, unimpaired by undependable personal likes and dislikes.

The design chosen and printed, thousands of packages leave Dow plants daily selling Dow quality to the world. Package design is a big job, yet it's but one step in a product's progress from research laboratory to customers' hands. THE DOW CHEMICAL COMPANY, Midland, Michigan.

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THE ST. LAWRENCE SEAWAY, OHIO, AND THE CHEMICAL INDUSTRY

Mr. Castle was appointed Administrator of the Saint Lawrence Seaway Development Corporation by President Eisenhower on June 23, 1954. Born in Portage, Wisconsin, Aug. 12, 1889, Mr. Castle was graduated from the University of Wisconsin in 1913 and before appointment to his present government post was engaged for 35 years in banking and other executive positions in which he has been identified with accounts pertaining to mining, construction, shipbuilding, manufacturing, and engineering. He was president of the Northern Minnesota National Bank, 1947-1954; is past president of the Duluth Chamber of Commerce.

By LEWIS G. CASTLE, JR.

Administrator
St. Lawrence Seaway Development Corporation

(Holding of A.F.C.A.'s annual meeting in Cleveland this year, June 16-17, directs attention to the vast undertaking to link the Great Lakes to the Atlantic for ocean-going shipping. This appreciation of the project has been written especially for this issue of the JOURNAL by Administrator Castle.)

THE ST. LAWRENCE SEAWAY, Ohio, and the chemical industry are being associated in ordinary conversation so frequently, that one might think the words properly go together.

The amazing growth of "Ohio's chemical shore" in Ashtabula County, where the chemical industry has spent $100 million dollars in the past decade, is a big reason for linking Ohio and the chemical industry.

Lake Erie's tremendous supplies of fresh water have been the big factor in decisions to build in or near Ashtabula, since the chemical industry requires vast quantities of water. Also, the lake as an avenue of low-cost shipping has attracted new industry, and Ohio's industrialists are predicting that the St. Lawrence Seaway will bring even greater wealth to the area.

Among materials that will be sent to Ohio by the Seaway are manganese ore from Brazil, India and Africa; chromium ores from Rhodesia and Turkey, and from Canada will come ilmenite, the basic ore for titanium, the new wonder metal.

Even now a vast new $31 million titanium plant is under construction, and it is entirely possible that the port of Ashtabula may receive a foreign shipping volume far beyond its wildest dreams.

Ohio's chemical boom in Ashtabula County began in 1946 when the Electro Metallurgical Co., (Electromet), a division of Union Carbide & Carbon Corp., bought the plant it had been operating for the government since 1943. Recently the company completed a multi-million-dollar expansion program. In 1948, National Distillers Corp., erected a plant nearby to produce millions of pounds of metallic sodium a year and thousands of tons of chlorine.

A short time later, Hooker-Detrex, Inc., announced plans for a $1 million plant to manufacture trichlorethylene in the same area.

In 1952, Linde Air Products, another division of Union Carbide, built an adjacent plant to produce acetylene and a short time later the Archer-Daniels-Midland Co., began construction on an $8 million plant for the production of alcohols by an improved sodium reduction process.

Now in operation is the new polyvinyl chloride plant of the General Tire and Rubber Co. These, in addition to the thumping big new titanium plant, are strong proof of industry's faith in the area.

In this chemical complex, the various companies sell to each other. Chlorine produced by National Distillers is piped over to Hooker-Detrex for the manufacture of chlorinated solvents. One of Hooker-Detrex's by-products is hydrogen chloride, used extensively by General Tire. Both General Tire and Hooker-Detrex also use acetylene, supplied by their neighbors. The new Archer-Daniels-Midland plant will use metallic sodium as a reducing agent, a material they'll get from National Distillers.

Ohio Port Development

Here's what some Ohio ports are doing to get ready for the Seaway:

TOLEDO: An $8000 study recommended construction of a $20 million general cargo terminal on the Maumee River with a $5.9 million recreational area on the bay.

CLEVELAND: A $40 thousand port development study is being made which contemplates the construction of a $15 million breakwater, and the City has proposed the construction of a large World Trade building for the holding of international trade fairs in that city.

ASHTABULA: Private industry is spending $3.7 million for construction of slips, docks and handling facilities, including two bulk cargo docks 2000 feet long and 500 feet wide.

Beside the growing chemical industry, Ohio is first among the states in producing machine tools, automobile and truck tires and general rubber products. It is the first ranking maker of flat glass products and is the top or very near the top producer of electrical appliances and table china and other ceramic wares.

Ohio has a $1,000,000,000 atomic energy installation, and has 20 percent of the Nation's steel capacity, with output second only to Pennsylvania. She produces much of the coal, and refines much of the petroleum that fuel her factories. There are extensive salt deposits in Ohio.

The State is next to the largest producer of general industrial equipment and electrical machinery, the largest producer being the State of Illinois. Ohio manufactures automobiles and trucks and farm equipment; it is a leading manufacturer of soap.

Ohio is the fourth largest grower of wheat, and the sixth ranking state in the harvesting of corn. Other principal crops are soy beans, tobacco, and grapes. Last year, the state raised more than 2 million head of beef cattle, and milked more than 1 million head of dairy cows.

Ohio's experienced factory labor force of 1,000,000 men and women has grown faster since 1947 than the working forces of four other competitive Great Lake States.

Ohio businessmen worked especially hard to bring about this state of affairs, and succeeded in bringing new industries to their communities.

While Ohio is only the 34th biggest State in area, it is the fifth most populous with 8,500,000 people residing within its borders, according to a 1953 Bureau of Census report.

We have recently developed an economic study and in quoting from it I can state that on a very conservative estimate, it is anticipated that in the first year of traffic operation, there will pass through the St. Lawrence River channels and locks a total cargo tonnage of over 36 million tons. Projecting those figures further, we arrive in 1965 with an estimated increase in cargo tonnage to 52 million tons. This tonnage applied to a reasonable toll rate assures adequate revenue to retire this investment within a reasonable number of years.

Tolls should be low enough to invite traffic, and high enough to retire the cost of this investment in Canada and the United States. I am confident that between the St. Lawrence Seaway Authority of Canada and our own corporation, as we near the completion of this great project, we will arrive at a toll rate that will be satisfactory to all shipping interests.

The magnificent potential of the Seaway coastline is easily seen. It is farther from Duluth to the Atlantic Ocean than it is from Gibraltar to Port Said at the far end of the Mediterranean Sea. The total United States shoreline of the Great Lakes is nearly 600 miles longer than the combined general coastline of the East and West Coasts.

It is clearly obvious that the utilization of a new artery of water transportation which will extend more than 2,400 miles into the heartland of the United States can only develop tremendous benefits.

When the Seaway opens, both United States citizens and Canadian citizens will begin the development of a new empire. Axes will again ring in the forests with renewed vigor, and the ore mines, metal mills and factories will pour forth their products to develop new resources and industries. New villages and great cities will be founded, and older towns and cities will increase in size and importance.

Population Increase from Migration

In the building of the Seaway, perhaps as many as a half a million people will, within ten years, migrate to its shores from other cities in America, and several hundred thousands of Canadians will make their living on the other side of the border in similar occupations.

The flow of population that followed the original opening of the West that made this country into the greatest world power is to be duplicated within another fifty years.

The frontier is to bolster America's greatness for many years into the future. The building of the Seaway will spell benefits for every kind of human enterprise.

The benefits that will arise from the Seaway are not to be segregated among industries, or between groups of American citizens.

The increase in wealth and population following the fruition of this great endeavor is not to be confined to the Great Lakes states and their immediate neighboring provinces in Canada, but the benefits will extend into all the vast reaches of undeveloped and unpopulated country of both nations.

The St. Lawrence River is a common boundary, and should be developed as a common responsibility by the two countries involved.

We look forward with great anticipation to this friendly association with the Canadian people, and I am confident that we will produce transportation facilities that will benefit all and harm none.

DISSATISFACTION CAN MEAN PROGRESS

(Continued from Page 7)

of management and organization, in technical "know-how," in manufacturing, and in methods of research and development. Industry, by the mere fact that it is freely furnishing members for our various committees and advisory councils, indicates that it is aware of its responsibility in the rapidly growing military-civilian national defense team—a team that cannot afford the luxury of being satisfied in any area of its national defense program. For satisfaction can lead to downfall, while dissatisfaction makes constant progress possible.

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LOGEX-55

By COLONEL HAROLD WALMSLEY, *Chemical Corps,*
Deputy Chief of Staff, Logex-55

This year's large scale logistical exercise of the Army in the Logex series and known as LOGEX-55 was scheduled to be carried out at Fort Lee, Va., during the period May 2 to 7. It was designed to test a new concept of logistical organization and procedures at Theater of Operations and Field Army levels, apparently in line with the recent reorganization of the Department of the Army. In this article Colonel Walmsley raises question as to some aspects of the proposed field staff alignments particularly in respect to the senior chemical officer. The views and opinions expressed are those of the author and their presentation here does not imply indorsement by the Department of Defense.—Ed.

ONE COLD, dark morning, April 19, 1775, a New England farm boy picked up his personal firin' piece, walked down the road, and fought for freedom at Lexington and Concord. Throughout the Revolutionary War his requirements were relatively simple and he supported himself essentially through his own resources.

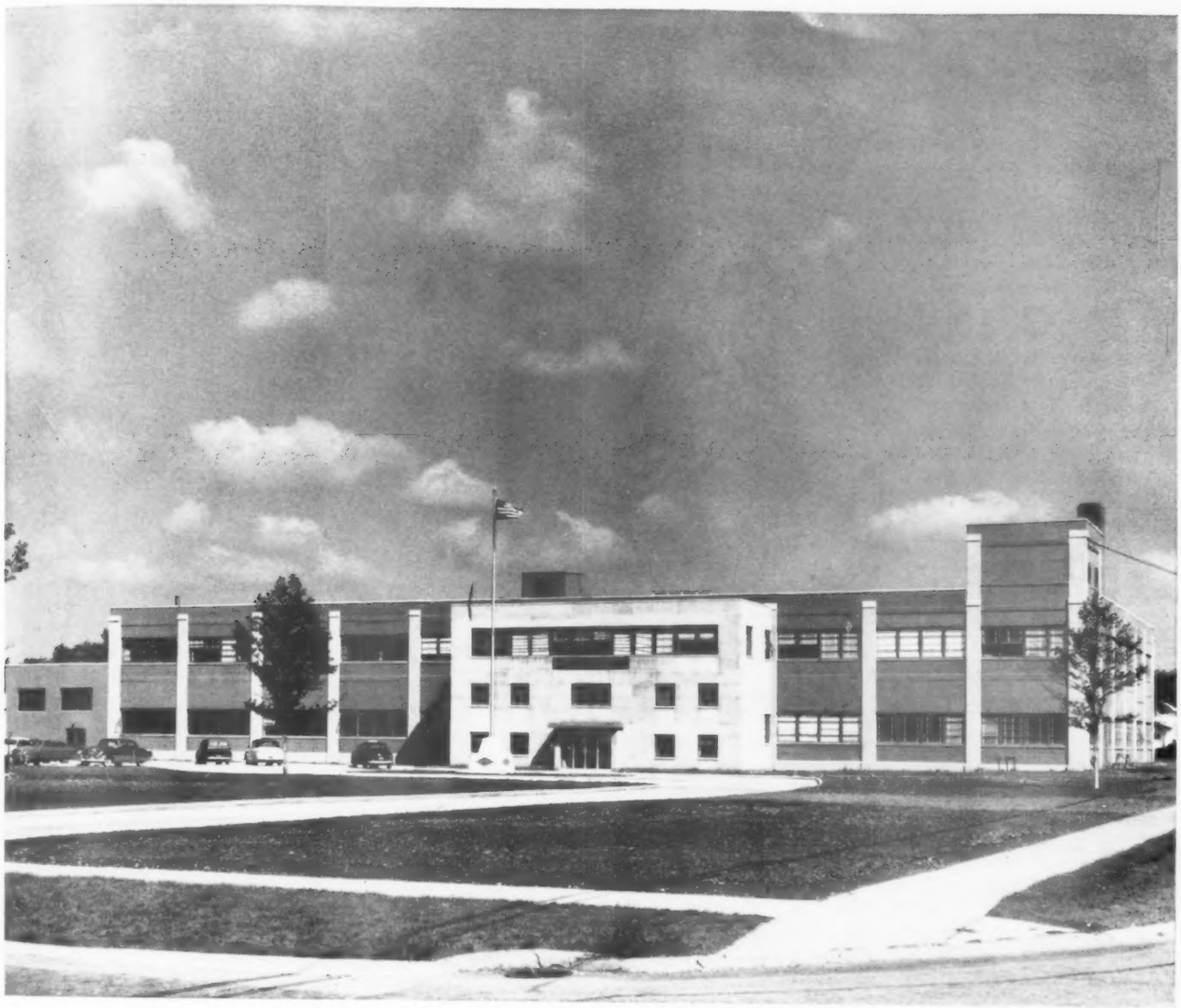
Since that memorable date the adaption of rapid technological advances to combat, with the resultant problems in logistics, make it no longer a matter of merely "walking down the road." Today logistics in support of the Army in the field have evolved into an exceedingly involved and complicated process. The magnitude and complexities of modern army supply management and operation dictate the intelligent selection of highly capable men and their intensive education and training in every aspect of this vital mission. Wisdom applied to continuous improvement in organization, methods and systems is imperative if logistics is to keep abreast of combat capabilities.

With these thoughts in mind, the Department of the Army in 1948 set up an annual major maneuver to assist the technical and administrative schools in accomplishing the logistical training of advanced class students. The maneuver, called LOGEX-55 this year (for logistical exercise), will be held at Fort Lee, Va., during the period 2 to 7 May 1955. The Army has also produced several proposals to revise support organization and procedure.

LOGEX-55 has been developed under the direction of Brigadier General James P. Cooney, Commandant, Medical Field Service School at Fort Sam Houston, Texas. In addition to a staff composed mainly of personnel from the Medical Service, each technical and administrative school, as well as the 1st Logistical Command, the Navy, Air Force, and Department of State, provided representatives to concentrate on their service and agency aspects of the play of the exercise. Chemical officers who have served as members of this planning staff are Colonel W. H. B. Howard and Captain Jo F. Rose, Chemical Corps School representatives; Lieutenant Colonel Nat Giambelluca, Assistant G-4, Plans Division; Lieutenant Colonel Harrison S. Markham, Operations Officer, Support Division; Lieutenant Colonel Jack F. Lane, Assistant Chief, Plans Division; and Major Albert H. Voegeli, Assistant Executive Officer, Plans Division.

Since a primary purpose of LOGEX is to provide a training medium for officer students, it is essential that the material include detailed information that is sound, realistic and represents a completely coordinated situa-

Colonel Harold Walmsley is Deputy Chief of Staff for LOGEX-55. Before his assignment to the LOGEX staff he was Deputy Commander, Chemical Corps Materiel Command, Baltimore, Maryland. He was stationed in Panama from 1940 to 1943 where he served as Chemical Officer for the Panama Canal Department and Caribbean Defense Command. He was Chemical Officer for the Ninth Army in the operations in Europe from 1944 to 1945. Upon his graduation from Industrial College of the Armed Forces, he served as Chief, Procurement Assignment Division and Deputy Director, Supply Management Directorate, Office, Secretary of Defense, during the period 1949 to 1951. Colonel Walmsley graduated from the United States Military Academy in 1932.



Diamond makes room for radiation research

Exploring potential uses for atomic energy in chemical processing is one of the main purposes behind the modernization and expansion of DIAMOND's Research Center at Painesville, Ohio.

An increased staff at the new laboratory will investigate, for example, the intriguing possibilities of harnessing gamma rays for chemical applications, particularly for research on polymerization, oxidation and chlorination.

With these new facilities, DIAMOND becomes one of the nation's first chemical companies with its own high-energy radiation source. AEC's Brookhaven National Laboratory fabricated for DIAMOND a 1000 Curie radioactive cobalt irradiation unit. It's equivalent to the radiation from 2.2 pounds of radium—almost one-half of the present world supply of refined radium.

Other DIAMOND research groups will use the new space and equipment for intensified work on plastics, calcium carbonates, chlorinated organics, and chromium chemicals.

Here, DIAMOND is making room for ideas to grow—ideas that lead to new products and processes benefiting both industry and national defense. DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio.

DIAMOND ALKALI CHEMICALS

Diamond Chemicals

tion capable of development through five and one-half days of play. The documents range all the way from political agreements on a national level to stock record accounts. Although LOGEX-55 employs no units in the field, the carefully simulated problems afford a maximum degree of realism for participating officers.

Some 1770 officers from 18 Army schools and agencies and from the Navy, Air Force and Department of State will take part directly in the play of the problem. They will be maintained by more than 3000 personnel—supply, administrative and housekeeping troops and permanent staff. Plans have been made to care for approximately 400 observers during the conduct of the maneuver. The Chemical Corps School will send 19 staff and faculty umpires, 31 student officers and 14 enlisted participants.

Formerly the principal purposes of LOGEX were to:

Afford student officers an opportunity to apply instruction received at their schools.

Emphasize intra-Army service team play and interservice cooperation required of Army, Navy, and Air Force in providing logistical support in an active theater.

Stress the importance of maintaining uninterrupted logistical support in the face of mass-destruction weapons.

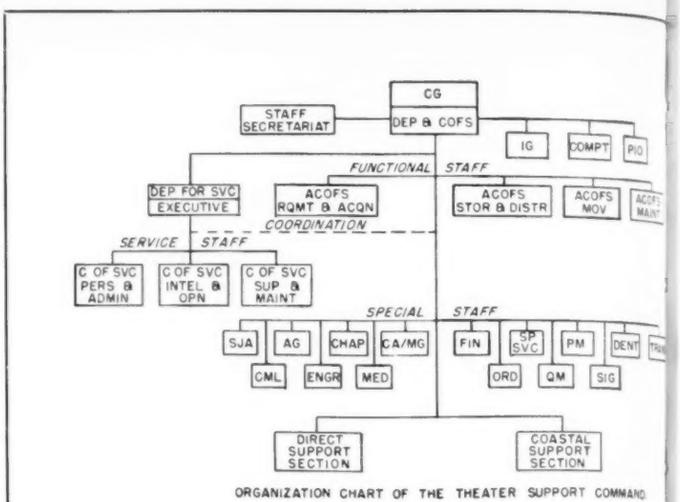
This year in addition to the above, LOGEX will, for the first time, present for evaluation a new logistical concept that has been developed by the 1st Logistical Command, Fort Bragg, N.C. To accomplish these purposes a situation is set up in which a type field army, and, to some extent, certain Navy and Air Force elements are supported by new type logistical organizations and procedures. Students of the several technical and administrative service schools will man the special staff sections and will command service troops in the field army and the communications zone.

The primary objective in any military operation is destruction of the enemy. A corollary, vital to the success of any modern military operation, is logistical support of combat elements. The two, being closely related and interdependent, are teamed together to attain the ultimate objective. Functionally, however, operations and support can be separated, provided care is taken to avoid tight compartments.

The new concept proposes to speed up logistical operations by simplifying, by decentralizing and by clarifying command. Effectiveness of logistics is to be increased by eliminating intermediate installations through the optimum use of modern transportation for the echeloning of supply in depth. Emphasis is placed on primary mission. Combat commanders would be relieved of all possible administrative and logistical functions so that they can devote their maximum attention to the destruction of the enemy. Their responsibility for service support would be reduced to the minimum essential for the proper employment of combat troops.

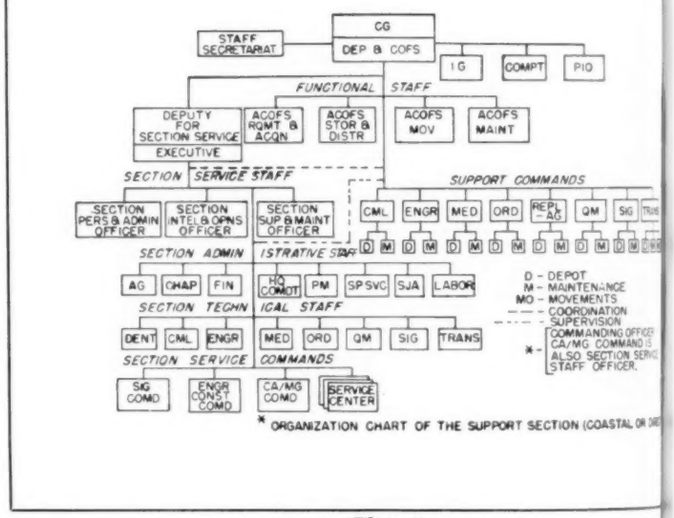
Fundamentally, then, the thesis here is a clear separation of "wholesale" (theater support) and "retail" (local support) logistics to provide primary effort to wholesale support and to subordinate all other logistics to it. Only those functions definitely performed for the benefit of the theater mission are wholesale functions. All others are local support or retail functions.

THEATER ARMY HEADQUARTERS, the senior Army element in a theater of operations, is organized with the conventional general staff. It is a supervising, planning and coordinating agency. Under Theater Army are the field armies (or army groups) and a *Theater Support Command*—parallel commands. Subordinate commands of the Theater Support Command are called Support Sections (Coastal and Direct). Theater Support Com-



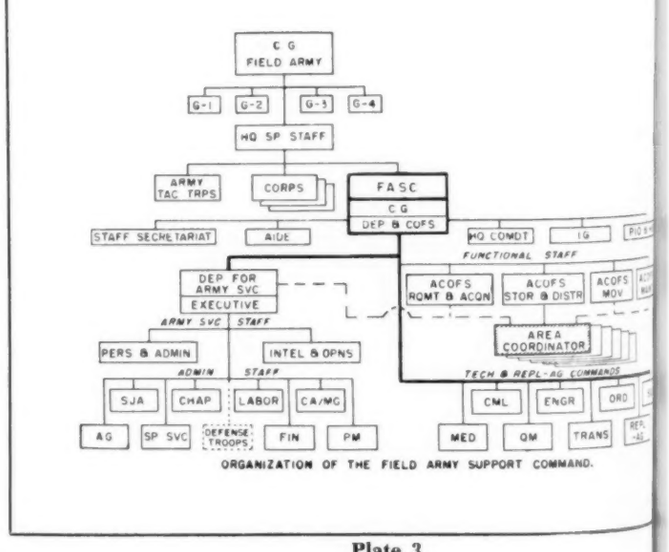
ORGANIZATION CHART OF THE THEATER SUPPORT COMMAND

Plate 1



ORGANIZATION CHART OF THE SUPPORT SECTION (COASTAL OR

Plate 2



ORGANIZATION OF THE FIELD ARMY SUPPORT COMMAND.

Plate 3

mand is responsible for the broad planning, coordinating and supervising of the activities of the support sections which perform all the operating functions of the command

Organizationally, the headquarters Theater Support Command is composed of a command group, functional staff, special staff, and a deputy for service and his staff (plate 1). The special staff is conventionally organized and performs usual staff functions within the Theater Support Command. An interesting feature of this organization is the dual responsibility of the special staff officer. The Theater Support Command Chemical Officer, for instance, would be the senior representative of the Chemical Corps in the Theater. As such he would advise the Theater Army Commander and his staff on technical and administrative matters through the Theater Support Commander. This Chemical Officer and his staff would constitute the theater requisitioning agency, maintain theater-wide supply control, perform technical inspections in the field armies, develop theater policies for the Chemical Corps, and determine application of means within the Theater Army. He is a staff officer only and confines himself to broad plans and policies pertaining to both "wholesale" theater logistical support and "retail" supply and service to the Theater Support Command. Since there is no clear definition in the responsibilities of this senior Chemical Corps representative pertaining to CBR intelligence and operations, it is logical to ask the question, "Who will advise the Theater Army Commander on those important matters?" Possibly the LOGEX-55 test will provide the answer.

Coastal and Direct Support Sections are organized identically (plate 2). The Coastal Section is established in a coastal area and provides the fixed type air fields, maintenance and supply facilities, general hospitals, and other essential heavy and fixed type support installations. This section is responsible for control and protection of lines of communication forward to the rear boundary of the Direct Support Section. The bulk of the theater stockages are held in this section. Normally, supplies are to be delivered directly from the Coastal Support Section to the field army supply points or even farther forward if practicable.

The Direct Support Section operates directly behind the field army. It contains only those support activities that are immediately necessary to provide tactical flexibility and mobility to the field army. Its stockages are held to a minimum and intended primarily for emergency issues.

The Support Section headquarters consists of a command group, functional staff, deputy for section service, and a section service staff group. In this organization two key chemical officers are provided: the Section Service Chemical Officer and the Commanding Officer, Chemical Support Command, Support Section.

The Section Service Chemical Officer is also the support section chemical staff officer with respect to *service* matters. His scope of responsibility is limited to that area encompassed by the section service mission. He commands all chemical troops not assigned to support commands and service centers.

On the other hand, the commanding officer of the Chemical Support Command is responsible for the support of *theater* combat Army forces with supplies, maintenance and services required to successfully accomplish the theater mission. He advises the Support Section commander and staff on all technical wholesale service matters pertaining to theater army support. He commands all troops and installations assigned for the accomplishment of his mission. In other words he is in the "wholesale" business. His "retail" support is provided by section service staff which employs a subordinate unit called a Service Center.

The Field Army Commander has been furnished a *Field Army Support Command* which is organized similar to the Coastal and Direct Support Sections (plate 3). It is designed to reduce logistical and administrative burdens of the forward units. Field Army headquarters confines its logistical activities to broad administrative and supply planning. Details of planning and operations are delegated to the field army support command where senior representatives of the technical and administrative services are asigned as commanders of technical service commands. Since the field army has no conventional special staff, these service commanders also serve as special staff officers to the Army commander *through* the field army support commander. There is no *direct* contact between the army commander and his senior chemical officer as there was in World War II. (Again the question arises—what are the responsibilities, if any, of the senior chemical officer within the field army in advising the Army commander in CBR intelligence and CBR combat operations?) The field army support command utilizes its chemical command, which is composed of Chemical Corps T/O&E units, to provide both wholesale and retail support to the combat elements. To increase field army mobility and flexibility, supply points are substituted for depots, levels of supply are reduced, and heavy maintenance and extended hospitalization is performed by the Theater Support Command.

Undoubtedly the test of this concept during the play of LOGEX-55 will be of value. The real proof, of course, is its application in combat. In the meantime it is fair to ask, although probably premature to answer, the questions,

"How does this concept add to the strength of the present doctrine?"

"How does it contribute to the elimination of the weaknesses in the present system?"

"Will this concept correct two principal weaknesses of World War II, Korean, and present day logistics—first, inadequate training and personnel management with the resultant ills in supply management and operations; and second, the inability of all types of existing transportation to keep up with and adequately support the highly mobile forces in the field?"

"Will it absorb the terrific impact of the atomic age?"

"It is quite clear that this concept places the technical service officer under the control of the 'G-4 activity' and isolates this individual with specialized 'know-how' from the commander—will this prove to be impractical?"

The writer does not have the answers to these questions but believes that if these areas are sufficiently highlighted during LOGEX-55, some answers may be forthcoming.

INDUSTRIAL ADVISORY COUNCIL

In response to a request from the Chief Chemical Officer of the Army, the Armed Forces Chemical Association has undertaken the mission of nominating a group of representatives of industry to constitute an Industry Advisory Council to serve the Chemical Corps.

It is expected that the Council will have about 30 members, drawn from executives of industrial and educational organizations, and will be subdivided into a number of committees composed of specialists in the various phases of industry applicable to the Chemical Corps' program.

TECHNICAL MANPOWER

Statement Before Committee on Armed Services
House of Representatives
United States Congress

The following statement was made by Walter E. Lawson, Chairman, Technical Manpower Commission, Armed Forces Chemical Association, at the House Office Building, Suite 313, before the Committee on Armed Services on March 1, 1955.

Mr. Chairman, Members of the Armed Services Committee:

With your permission, I should like to present a short statement, and thereafter to answer such questions as your Committee may wish to ask.

My name is Walter Lawson. I am the Chairman of the Technical Manpower Commission of the Armed Forces Chemical Association and the former President of this Association. I likewise am a member of other manpower committees, or an invited guest at their meetings. Our Manpower Commission differs somewhat from those established by other societies with which I am acquainted, because our members have served fairly extensively in the Armed Forces and after retirement are holding important positions in Industry. We think we are in a good position, by reason of our several backgrounds of experience, to testify on matters concerning the use of technical men in the Armed Services and on Reserve matters, particularly as dealing with technical men.

May I say first that I have not had the opportunity of checking all my statements with our own Commission members, but if there are any differences between us, they are only in the intensity of feeling and not in the subject matter itself.

We support wholeheartedly the essential features of Mr. Brooks' bill, H.R. 2967, because we believe firmly in an adequate force to defend the United States against all enemies. We believe in a strong military force; we believe in a strong Reserve. My suggestions with reference to H.R. 2967 are designed to strengthen the bill; not to weaken it.

My first principal item in this presentation is that all men and women be assigned where they can do the most good for our country, not as either the Military or the civilians think, but as judged by the best minds of our country.

In considering improvements to H.R. 2967, I wish to emphasize as the most important point the establishment of a National Manpower Board, appointed at Cabinet level by the President of the United States. Simply by repetition I want to stress this as the most important subject to strengthen this bill. I fail to find in H.R. 2967 a description of this Board, the mechanics of its appointment, and the responsibilities of its operation. The Military, Industry, Research, and Education should have appropriate representation on this Board. The bill setting up this Board should give *appropriate* recognition to similar boards set up at state and local levels, so that better appreciation of individual abilities would be assured. The importance of the National Manpower Board is generally accepted; an important point remaining is the definition of the responsibility of the Board. I urge strongly that its responsibility be to the President of the United States.

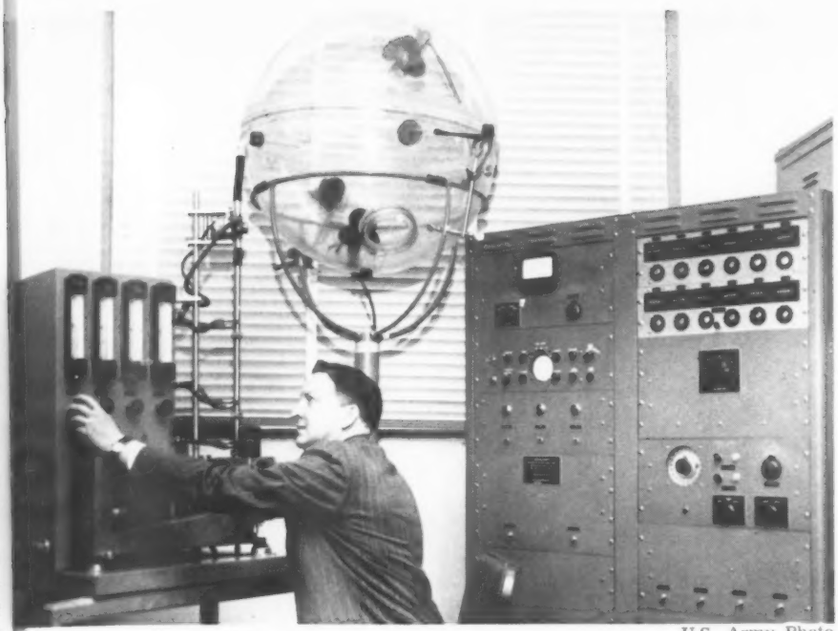
Three other items of major importance to the bill might be mentioned, two of which are definitely concerned with the National Manpower Board. The first of these is the continuous screening of Reservists to assure proper assignment, consonant with changes in their abilities and their education. The continuous screening of Reservists will give the assurance that each person is fitted in to the place where he can be of the greatest service to his country.

While I believe in early training, so that a person on active duty learns the primary essentials of military discipline early in his career, screening is necessary to place the man where he can serve best and especially to select those exceptional individuals, few in number but great in importance, who may help change the outcome of a war. I can cite two instances of this type. One was Moseley of Great Britain, who fell at Gallipoli in World War I. Still below thirty in age, he gave promise of being perhaps the greatest physicist in Britain, and his untimely death was a profound shock to men who believe in the importance of science. The other man was Gallwitz, who was the top man in exterior ballistics for Germany. Gallwitz desired promotion from Brigadier General to Major General, and this required a year's service in the field. He fell before Leningrad. I have thought often of the effect of his death on the progress of the V2 rockets against Britain. I had the opportunity of studying German explosives research in 1945, and I was impressed by the progress they had made. No one can foretell what might have been, but one point is certain—the death of Gallwitz retarded the development of rocket work in Germany. The inescapable conclusion is that men should be assigned where they can be of the greatest value to their country. This is especially true of technical manpower in these days where science is perhaps the dominant feature of success in war efforts.

The third, and last, item after Manpower is promotion in the Reserves. H.R. 2967 makes no provision for promotion in the Standby Reserve. If there is a steady transfer of men from the Active Reserve into the Standby Reserve, we shall later be faced with men in the Active Reserve who will not be backed by senior men in the enlisted grades and by senior officers in command. We are looking not only for the present or the immediate future, but are, I hope, taking the long-range stand; and for this we shall need experienced officers who will retain Active Reserve duty of a sort and thereby continue to progress in the ability to command. We should not have an Enlisted Reserve that ends with the rank of Sergeant, for we need the higher noncommissioned officers as well. Similarly, we should not have a Reserve of men whose top rank is Captain. There must be Regiments, Divisions, and even Corps to command. I should like to leave with you the thought that promotion is an important part of the Reserve picture of the future.

I shall be happy to answer questions on topics with which I am familiar. Thank you.

W. E. LAWSON, *Chairman*
Technical Manpower Commission
Armed Forces Chemical Association



—U.S. Army Photo

Mr. Nelson E. Alexander, Chemical Corps electrical engineer, adjusts the aerosoloscope, a device for counting and measuring microscopic airborne germs, dust, and moisture particles.

GERM COUNTER

An electronic instrument which measures and counts microscopic airborne germs, dust, and moisture particles has been developed by Mr. Nelson E. Alexander, an Army Chemical Corps engineer, at Camp Detrick, Maryland.

The device, known as an aerosoloscope, measures and counts airborne particles, one at a time, at the rate of 100 per second. It is equally capable of counting radioactive particles and determining their size.

Mr. Alexander forsees extensive use of the device by public health agencies and industry as well as by the Defense establishment.

The instrument eliminates many of the inaccuracies occasioned by particle instability, evaporation, agglomeration and mechanical distortion in counting with a microscope.

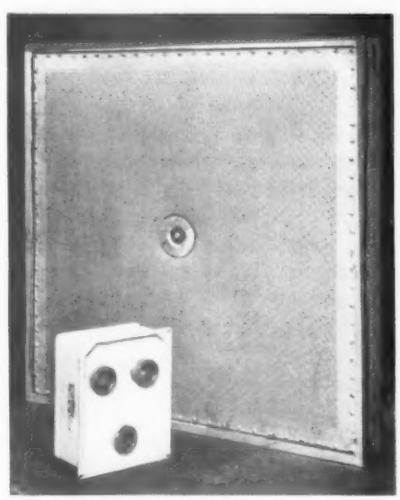
The principle of the aerosoloscope is based on the phenomenon that the dust particles or "specks" observed in a shaft of light are in fact only reflections of the particles themselves.

As airborne particles in concentrations of up to 15,000 per milliliter pass through the instrument they are diluted and their flow rate is controlled in such a way that each one is individually illuminated.

The reflection caused by the illumination is detected by a photomultiplier tube. Since large particles reflect more light than small ones, the photomultiplier tube, in conjunction with other electronic apparatus, is able to determine the size of each particle. The electrical impulses created are transmitted to a set of 12 dials. The first dial records the number of particles 1 to 1.4 microns in diameter. Each succeeding dial records slightly larger particles than the preceding dial. The twelfth dial records the number of particles 45 to 64 microns in diameter. (The increases are in multiples of the square root of two.)

The history of the aerosoloscope goes back about six years when construction started on a preprototype model. In early 1951, a contract was placed with the Armour Research Foundation to develop a prototype and construct the two complete and usable instruments since installed at Camp Detrick.

A counter, similar in certain respects and based on the same physical principles, was developed independently by Professor Frank T. Gucher, Jr., now at the University of Indiana.



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R&D CHEMICAL CORPS INVITES ASSISTANCE ON PROJECTS

Do you have information on any of the following subjects which might be of assistance to the Chemical Corps? The list was prepared by the Corps in an effort to tap all possible sources of information not currently being utilized. It is an initial screening of Chemical Corps projects to reveal unclassified subjects on which the Corps would like to have help. It is planned to revise the list at least semi-annually to keep it current. The suggestion for this feature originated with Dr. Walter S. Guthmann, Chairman of the Research and Development Committee of the Midwest Chapter. If any A.F.C.A. member has information on these subjects, or knows where it can be obtained, he is asked to communicate with The Chief Chemical Officer, Department of the Army, Washington 25, D.C.

1. **Adsorption of Noble Gases by Solid Absorbents Literature Survey:**
A literature survey of all known information on adsorption of argon, helium, krypton, neon and xenon by activated charcoal and other solid absorbents.

2. **Effects of Low Temperatures on Metals:**
Existing gas containers are made of steel which is under stress from the pressure. Equipment must be capable of being operated at minus 65° and be stored at minus 80° F.

3. **Instrument for the Determination of the Velocity of Sound in Liquids:**
A field method is required to rapidly determine the important physical characteristics, i.e., viscosity, of flame weapon fuels. It is desirable to develop a sonic viscosimeter to determine if the velocity of sound in the gel can be converted directly to viscosity with sufficient accuracy to provide information of the physical properties of the fuel.

4. **Development of a Method to Determine the Elasticity of Gels and/or Rubber Solutions of Very High Viscosity:**
The Gardner Mobilometer, Stormer viscosimeter, CWS torsionometer, paralled plate, and CWS plastiometer methods have been used to evaluate the elasticity and viscosity of incendiary gels. Improvements on these methods or new methods to allow more precise correlation with field performance of gels are desired.

5. **The Static and Dynamic Elasticity of Gels:**
Determine the stress-strain relationship of elastomeric materials both in the "dry" and in the jellied state, with special emphasis on the relationship under conditions of very fast deformation.

6. **Preparation of Finely Divided Solids:**
Develop techniques and theory underlying the production of finely divided solids.

7. **Bond Distances and Angles in Amino Acids:**
Determine the interatomic distances and bond angles of free amino acids bound in a protein.

8. **Travel of Aerosol Clouds:**
A survey on the medium distance travel of aerosol clouds. Emphasis on the distance of travel, particle size and density of the particular matter concerned, rate of precipitation with distance of travel, height of chimney from which fume was discharged, wind velocity, and other pertinent data.

9. **Theoretical Considerations Involved in the Mechanism of Penetration of Vapors, Aerosols, and Liquids Through Permeable Cloth:**
Theoretical aspects involved in the penetration of vapors, aerosols, and liquids through permeable fabrics. This is important in that it may markedly influence future designs of protective clothing.

10. **Detection of Chemical Warfare Agents by the Methods of Chemical Microscopy:**
Development of chemical microscopical methods for detection of toxic chemical agents.

11. **Synthetic Rubber and Plastics Products Resistant to Highly Corrosive Chemicals:**
Study synthetic rubber and plastics products that may be used alone, as protective coatings for metallic equipment, or as gasket and packing materials for typical Chemical Corps plant processes. These products must be resistant to highly corrosive chemicals.

12. **Plastics for Protecting the Skin Against Thermal or Chemical Injury:**
A compilation of information on plastics and plasticizers which could be used for the protection of the skin against thermal or chemical injury.

13. **Development of a Method for Measuring Vapor Pressures:**
Development of a method for measuring very low vapor pressures over a wide range of temperatures. (Temperature range from minus 80° F. to plus 180° F.) Measurement of vapor pressures in the neighborhood of 10-3 to 10-5 mm. of mercury is desired. Isoteniscopic measurement is inadequate.

14. **Automatic Injector Devices:**
Develop an automatic injection device for the administration of therapeutics.

15. **Noncorrosive Decontaminating Agent:**
It is desirable to develop a decontaminating agent that is noncorrosive to metals and nontoxic to animals and humans.

16. **Diffusional Barrier:**
Develop a new or improved diffusional barrier which will remove toxic vapors and permit air and moisture transmission.

17. **Radiation Meter:**
Develop a small portable field radiation meter capable of measuring a wide range of radiation.

18. **Detection and Identification of Microorganism in the Atmosphere:**
To develop procedures and equipment for rapid detection and identification of microorganisms in the air. The equipment must be light, portable and capable of being operated under field conditions by personnel with minimum training.

19. **Toxicity of Marine Plants and Animals:**
Literature survey of toxicity of organic marine plants and animals.

20. **Toxicity of Fungi:**
Investigation and identification of toxic fungi.

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CBR-PROOF NAVY LAB

The Navy has announced the completion of a fireproof, windowless chemistry building at the Naval Research Laboratory, Washington, D.C., that is designed to provide above-ground protection against atomic, biological, and chemical attack at minimum cost.

The structure, built of monolithic type reinforced concrete at a cost of $335,000, has bacteriological warfare and chemical warfare filters installed in its air-conditioning system. Air locks on revolving-type doors provide a pressurized, contamination-free atmosphere throughout the entire second floor. Provisions also have been made for emergency personnel shelters and emergency power sources.

The Navy's design objective was to provide a maximum amount of protection against attack at an additional cost not to exceed five percent of the total construction cost. This precluded underground construction, thus providing only partial protection against atomic attack.

The washroom and toilet facilities are so designed that they can be readily converted to decontamination shelters.

The new laboratory will permit chemical research investigations under simulated shipboard conditions.

The windowless laboratory rooms have overhead heating. Wire-glass panels between adjoining work areas prevent a cell-like atmosphere.

One feature of the structure which reflects the nature of the chemical work to be performed rather than Navy building policy, is a large air-tight chamber lined with stainless steel, in which materials useful industrially but harmful to individuals may be studied. External instruments and controls furnish the needed scientific data on the materials being studied.

MAJ. GEN. WILLIAM M. CREASY
Chief Chemical Officer, U.S. Army

SMOKE TO PROTECT FROM A-BOMB HEAT

By MAJ. GEN. WILLIAM M. CREASY

Great Potentiality of Chemical Corps Screening Operations for Meeting One of the Major Problems of Present-day Civil Defense Is Discussd by the Chief Chemical Officer in Washington's Birthday Address to Chemical Engineers at Charleston, W.Va.

To have been asked to be your guest speaker this evening is a real honor, and I am most happy to be here.

I am also most happy to see that besides the members of the American Institute of Chemical Engineers, there are representatives here of the American Chemical Society and the West Virginia Society of Professional Engineers, as well as other members of industry and business. It shows the unity of spirit that is so necessary in life today. For all of us, the military man, the professional man, the industrialist and "John Q. Citizen" are bonded together in a common cause—to preserve the liberty and freedom envisioned by our forefathers and exemplified in the actions of George Washington nearly two centuries ago. It is also fitting that we are meeting here this evening on the day all America commemorates as the birthday of the "Father of Our Country," for it is the scientific engineering profession which today is finding and developing the means of preserving the ideals Washington and his tattered army fought, suffered and died for.

On January 2, 1790, President Washington made his first annual address to both Houses of Congress. In that memorable message was this sentence, "*To be prepared for war is one of the most effective means of preserving the peace.*"

Although those words were spoken 165 years ago, they are more true today than they ever were. For today, preparedness includes much more than mere men in uniform, rifles, cannons, and ships of the line. Science and engineering have given the world the intercontinental bomber, and the nuclear bombs it can carry, plus the thousands of other scientific and technical means a nation today must possess if it is to be a military power. And industrial science has provided the ways and means of producing these things in mass quantities. This then, means that the stronger a nation becomes in scientific warfare, the more aware it must be of the consequences of combat with a similarly strong power. Thus it is that the scientific contributions to the preparedness programs of our own, as well as those of other great nations, can lead to the deterrence of warfare, and a realization of the peace that we all seek.

But in this preparedness race, we cannot let ourselves become complacent or tend to rest upon already-achieved laurels. Any moment of letdown will result in a weakness in our national defense program, and we will lay ourselves open to attack by those who would destroy liberty and freedom. For every new weapon that we, or any other nation acquires, we must develop a defense that can meet its challenge. On an over-all basis then, our preparedness program must be one of sustained effort to provide our nation the means of meeting the aggressive forces of another nation in combat; of supplying our forces with the weapons, munitions, and equipment so necessary for them to achieve victory in combat; and of protecting our sources of supply from enemy attack.

Chemical Energy for Defense

The Chemical Corps is vitally interested in all three phases of this preparedness program. We must intensively study every means by which chemical energy can be enlisted in the national defense program to maintain a technological lead over a potential enemy. We must work closely with industry; for, since nearly 90 percent of the items the Corps requires in time of war are strictly military in nature and have no civilian counterpart or are not ordinarily made by industry in large quantities, we must prepare an industrial mobilization planning program that will be effective if the time should come for its use. We must also work closely with the Civil Defense Administration and the U.S. Public Health Service.

devising the ways and means of protecting our people, our cities, and our factories from enemy attack.

The Chemical Corps operates in a broad field of endeavor, as broad and varied as the chemical industry itself. It is a diversified field that ranges from the development of protective masks against toxic agents, to developing new vaccines, to finding new uses for screening smokes. It is about the latter that I will speak this evening.

The use of smoke to deny enemy observation in warfare is not new, since there have been scattered references about it in history since 2,000 B.C. However, the methodical, planned use of smoke in battle was a development of World War I.

The attempts to use smoke for concealment during World War I might be considered crude in the light of what we know today, but they did pave the way for the acceptance of smoke as a primary offensive and defensive means during World War II.

For nearly a quarter of a century after World War I, the Chemical Corps argued that smoke, when used in conjunction with an attack upon the enemy, would give the attacking force a four-to-one advantage. Like ideas for the use of incendiary bombs from aircraft, the arguments fell mainly upon deaf ears. However, where instructions and demonstration could be given the military, this four-to-one advantage fact was accepted. This use of smoke in conjunction with the Infantry's offensive attack has since become more and more accepted, and important.

Defensive Uses of Smoke in World War II

The defensive use of smoke to hide vital areas against enemy bombing was being demonstrated by the British before the United States got into World War II. The Corps had no "selling" job to do in regard to the use of smoke in this manner. As a result, we carried out extensive smoke screen operations over such vital areas as ports, cities, beachheads, and industrial complexes both in the combat zones and on the homefront. Here, on the North American continent for instance, we had large-scale smoke operations set up for defense of the Panama Canal, the West Coast aircraft plants, and the vital locks at Sault Ste. Marie between Lake Superior and Lake Huron. These large-area screens were to forestall possible visual bombing tactics by enemy aircraft.

As an example, let's take a look at what happened at Algiers in North Africa in 1943. Algiers has a harbor in a sort of half moon shape and the city runs up steeply in a semi-circle from the harbor. At no time while we were carrying on smoke operations in the city, was it successfully bombed by the enemy. The smoke generators were set up in the harbor area and in the hills around the city. Invariably, when the German bombers came over they dropped their lethal loads at the top, or inshore, edge of the smoke screen thinking that they were dropping them at the edge of the harbor. Several of the captured German pilots who had been forced to bail out in the area, were taken out to see where their bombs had hit. They could not believe what they saw. They all thought that they had good hits on the edge of the water. The smoke most certainly had a good camouflage effect and proved its worth as a passive defense measure. However, this was prior to the advent of radar bombing which makes accurate bombing possible in spite of smoke.

The smoke for these defensive screens is produced in two ways. The principal means is through use of mechanical smoke generators, which turn a special oil into great volumes of smoke in a very short time. For small operations, and to fill holes in the screens made by the mechanical generators, we have what we call smoke pots. These are containers of solidified chemical compounds which cause a heavy smoke when burned.

Since the days of World War II, when radar was invented, there have been a number of arguments expressed that the technique of radar-bombing has made smoke protection of military objectives obsolete. As far as bombing accuracy is concerned, this is true.

Smoke to Protect from A-Bomb Heat

However, the Chemical Corps has been conducting studies toward a new use of smoke screens that will make them more important than ever. Smoke screens can be used to protect vital areas from the thermal radiation produced by the explosion of an atomic bomb. For we now know that a blanket or screen of smoke placed between a heat source and a target area can shield the target from most of the heat.

When an atomic bomb detonates there are three major casualty producing effects: gamma, and neutron, radiation; blast, or pressure, action; and thermal, or heat, radiation.

The gamma and heat radiation occur at the instant of detonation while the blast, or pressure wave, follows within the first few seconds after the detonation.

For purpose of illustration, let us consider the effects of what we call a nominal bomb, one producing a 20-kiloton yield, or a force equal to the explosion of 20,000 tons of TNT. This was the type of bomb that was dropped at Hiroshima.

The bomb was detonated at 2,000 feet altitude, and caused gamma radiation out to about three-fourths of a mile. The blast effect caused almost complete destruction out to the one-half mile mark, and destroyed all but the strongest buildings out to about one mile. The heat flash produced burns on people and started fires out to about the two and a quarter-mile radius . . . nearly five times as far as the gamma radiation, and more than twice the distance of the blast effect.

The relative importance of the heat flash becomes even more impressive when it is considered that the area damaged by the severe blast was three square miles, while the area affected by the heat was 16 square miles.

As the size of the bomb increases, the overall casualty effects increase, but the increase due to heat effects becomes a larger factor than the increase due to blast. Protection against thermal radiation of nuclear weapons becomes increasingly important as their power increases.

It has been estimated that 20 to 30 percent of all the fatal casualties in Japan occurred during the first one second of the two explosions because of the thermal radiation. The atomic explosions also started a large number of fires which burned for many hours producing even more casualties in those who were trapped in collapsed buildings and could not be rescued. It has been estimated that burns of all types, flash and flame, were responsible for more than half of the fatal casualties and probably at least three-fourths of all the casualties at Hiroshima and Nagasaki.

As a result, the development of methods for neutralizing the heat effects of an atomic explosion has been one of the major objectives of the United States' military research and development program in the field of atomic defense. The Chemical Corps has been carrying on its research studies for several years. We have now reached the stage where we feel it will be well to apprise the American public of the fact that we have a means of minimizing the effects of an A-bomb explosion to a certain degree. I must say "to a certain degree" for the reason that the use of smoke screens will not stop the other two effects of such an explosion—the blast or pressure wave, and the gamma radiation.

However, these two effects are expected to occur within a relatively small radius of the explosion as compared with the heat effect, so we have directed our work toward reducing the thermal radiation area down to the size of the blast damage perimeter.

Protection Idea from Mother Nature

Actually, in studying the thermal attenuation effect of smoke screens we have done nothing more than borrow another of Mother Nature's ideas for the benefit of mankind.

We have all known since childhood that a layer of clouds or a blanket of fog between us and the sun reduces the feeling of its warmth; ergo, since the atomic bomb gives off heat, why not a layer of man-made clouds or blanket of fog between it and the target area to reduce the heat effect? The question is as simple as that—in theory.

Protection from the heat of an atomic explosion can be obtained merely by preventing the heat rays from coming in direct contact with the skin. The thinnest type of non-transparent material, even a white handkerchief thrown over the face, will shield materially from direct exposure to the visible, and near-visible, heat emanating from the point of detonation. Light colored clothing is particularly good as it reflects almost all of this radiation. However, dark colored clothing can absorb heat to such a degree that it will burn skin in contact with it, or catch fire and produce burns on the skin. But this form of protection cannot be considered the practical answer to the problem, since we know that personnel cannot take evasive action to escape the instantaneous thermal radiation, unless forewarned of the impending atomic explosion.

Just like the heat from the sun, the heat from an atomic detonation is measured in calories, and the number of calories received on any given surface in a second will determine the degree to which the surface will be burned. For instance, slight skin burns will result from three calories per square centimeter, trash will catch fire at the three to four calories level, and light wood will generally ignite when it receives 10 calories per square centimeter per second.

On a bright day, the sun heat at the surface of the earth is normally three-hundredths of a calorie per square centimeter per second. Such an exposure means little to the skin of your body as such. But prolong that one second into minutes and hours, and cases of sunburn, ranging from mild to severe, will result. The atomic bomb, however, isn't as gentle as the sun in its burning action. In less than one second from the time of detonation, it gives off the heat of thousands of suns. Thus, in the blink of an eyelid it gives off the number of calories of heat required by the human body for a mild burn, one which might take many minutes or even a few hours to obtain from the sun. When it is realized that the severely burned group at Hiroshima alone probably exceeded 34,000 people, some idea of the magnitude of this heat effect of an atomic bomb can be seen.

Of equal importance is the need to reduce the number of fires resulting from the ignition of trash by heat flash from the A-bomb. Trash is normally present in a city or industrial area, and investigations have determined that mass fire can be built up from ignition of trash out to distances of two and a quarter miles from the point of explosion of a Hiroshima-type bomb.

Thus, if these burn casualties and the possibility of trash ignition can be reduced, it will be a major defensive measure.

Smoke Scatters the Heat Rays

In a clear atmosphere, thermal radiation normally reaches an object on a direct line from the bomb source. By introducing a smoke screen, the radiation is scattered away from the objects within the screen, and the radiation which reaches the object has been attenuated by this scattering, thereby minimizing burn-producing and fire ignition.

In order to prove our theory about the heat attenuating properties of smoke, we have carried on a research program that will culminate in a large-scale test out in Nevada.*

Under a contract with us, the University of Michigan's Chemical Engineering Department, using their high speed computing facilities, has carried out an extensive study to determine the scattering of radiant energy by fog-oil smoke screens. In our own laboratories we've used high-intensity carbon arc searchlights, casting their beams through indoor smoke clouds to study the heat reduction. Over the Army Chemical Center, in Maryland, and the Dugway Proving Ground, in Utah, we've laid smoke screens that covered several square miles and then measured the reduction of the sun's heat with delicate instruments. We've dropped large flash bombs, of the type the Air Force uses for night combat photography, to simulate the radiation of an atomic bomb and measurements have been made of the reduction of this radiation effected by the smoke screens.

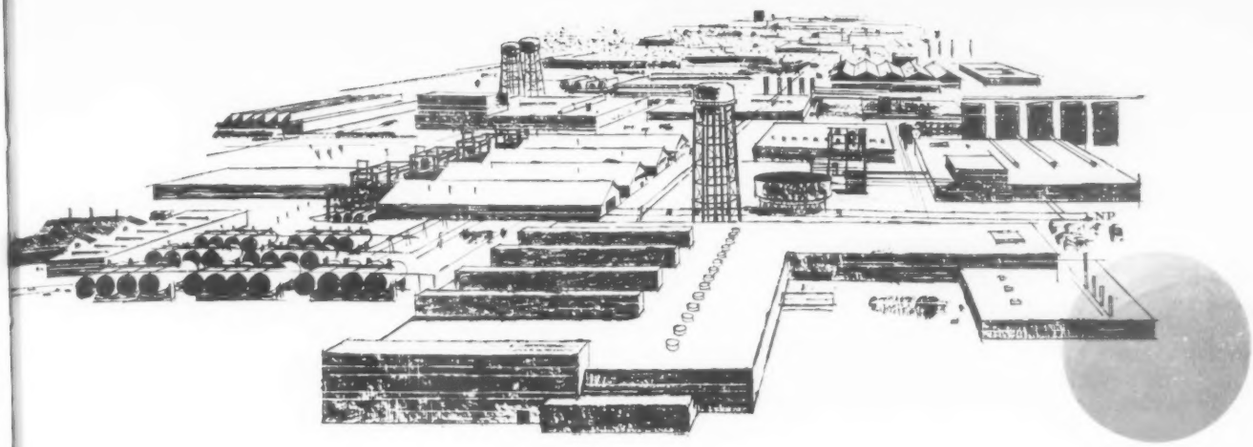
Our work included the smoking out of the actual heat flash of an atomic detonation during one of the Atomic Emergy Commission's tests in Nevada. However, insofar as our smoke theory was concerned, this was only a small-size test—really more in the nature of an experiment—since our smoke screens covered less than a quarter of a square mile in order not to conflict with the main objective of the AEC's work. We employed two types of clouds, and despite the small areas covered by these clouds, the results were encouraging and confirmed our previous findings.

Basically, what we found out during the Nevada test was the same information that we had extrapolated from the laboratory and field tests—that a smoke cloud can reduce the heat from an atomic bomb detonation very considerably.

This attenuation depends mainly on two things: the distance travelled through the cloud between the measuring point and the detonation, and the density of the smoke cloud or blanket between these two points. Naturally, the farther the radiated heat must travel through the smoke cloud the greater will be the attenuation; and the heavier the density of the smoke cloud, the more this heat effect will be cut down. Thus the higher attenuation figures are achieved farther away from the point of explosion. Therefore, it is easy to see that at a point only a few hundred yards from ground zero the attenuation factor will be slight, but out at the two-mile radius it will be great. This is the effect we are looking for, since our program is to reduce the thermal effect outside of the area where the pressure, or blast, effect is greatest.

With the results of the preliminary Nevada test at hand, we continued our laboratory and field work to the point where we are now ready to apply the final test. Since the intense heat of an atomic explosion cannot be duplicated in the laboratory or field on a scale necessary to test the smoke protection theory to the fullest extent possible, the final proof of the effectiveness of smokes can be obtained only by an actual atomic test. This will be done on a full-scale basis at the current series of atomic tests in Nevada as a final check on all our laboratory and field work. Because of the test's implications toward defending the homefront in case of an atomic

*Test reported in daily press March 12, 1955.



PREVENTIVE MEDICINE

for biological warfare...and its peacetime application

It was early in 1954. Blaw-Knox under contract with the Army Corps of Engineers, quietly completed construction and test operation of the Army Chemical Corps' top priority facility . . . the Pine Bluff Arsenal "production development laboratory."

Here is one of the most complex and top secret projects since the development of the atom bomb. Its purpose? Production and development of biological warfare munitions to strengthen our retaliatory capacity in hopes of preventing another war . . . creation of new antibiotics and vaccines to increase the effectiveness of our immunization against diseases in both war and peacetime . . . experimentation with new means and facilities for detection of diseases and rendering them impotent . . . and accomplishment of these objectives without endangering the plant workers or community.

Although information about this facility's operation and production remains highly classified, the story of Blaw-Knox participation now can be told in part.

The Pine Bluff project was a unique experience for the Army Chemical Corps as well as Blaw-Knox. It involved design and construction of special equipment for which no prototypes existed . . . the most exacting leak tests known . . . unusually close mechanical and structural tolerances . . . accurately and automatically controlled temperatures, humidity, ventilation and process cycles. Over a third of its multi-million dollar cost was devoted to an elaborate system of safety devices. In addition to performing all engineering, procurement and complete erection, Blaw-Knox collaborated in initial start-up and testing of this extensive, first-of-its-kind facility.

Our selection for this important project illustrates the faith placed in Blaw-Knox engineering and construction skills, ingenuity and ability to work as a part of the team. When you are in need of a realistic solution to a processing problem and completion of a project on time and within the budget, call upon Blaw-Knox.

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war, the Civil Defense Administration will be following close the results of this test.

Using Two Types of Smoke Screens

I have mentioned that in this program we are using two types of clouds, one is the fog-oil type used in large area military operations, and the other is carbon smoke, much the same, but in heavier volume, as you might find over an industrial city.

Actually, to apply the term "smoke" to the fog-oil mixture is a misnomer, for in reality it is nothing more than a heavy fog created by a suspension of hydrocarbon oil in the air. This artificial fog is produced by heating the oil to a temperature that causes it to vaporize, and then passing the vapor into the air where it is condensed to form a fog, or what we call a "smoke" as a matter of expediency. The technique is very similar to a so-called "smoke" that every housewife is familiar with— the steam from a teakettle. Water, vaporized in the teakettle, condenses into steam when it hits cool air. But while the steam disappears within a matter of seconds, the fog-oil smoke lasts for several hours in the air. This smoke contains literally billions of droplets of oil, each one only a 50-millionth of an inch in diameter. These very small droplets have the unique property of causing heat or light to be scattered in the same manner as automobile headlight beams are affected by fog on a road at night, a phenomenon with which most people are familiar.

On the other hand, the carbon smokes reduce the heat by absorbing the radiation, instead of reducing it by a scattering effect such as is achieved with the fog-oil. When our tests showed that the carbon smokes were just as effective—and some tests indicate they may be even more effective—as the fog-oil smokes, the protective potentialities became apparent.

This was because almost every industrial city can make carbon smoke if it so desires. In fact, during the war, the British found that industries could assist in the smoke screening of their vital cities by what the efficiency experts would call 'improper operation" of their coal-burning boilers. The same would hold true for oil-burners.

All of us are acquainted in one way or another with the "smogs" that develop over our cities. These "smogs" have been partially attributed to the smoke put out by industrial smokestacks. Generally they are nothing more than a light haze, but sometimes they become heavy enough to practically obscure the sun.

The carbon smoke we have used in our tests, and will use in Nevada for the large-scale test, is similar to this industrial smoke. It can be made in rather large quantities if smoke-prevention equipment is not used in industrial areas, or boiler engineers are allowed to use the improper air-fuel mixture in their fireboxes. Such smokes will not require a large amount of special equipment, but could be supplemented by fogs and smokes produced by the same type of Chemical Corps smoke equipment as used by the Army. Their use, of course, would depend upon having sufficient advance warning of an attack.

Now I do not want to create an air of complacency among our people. Nor do I want to give the impression that the problem is completely solved by the mere fact that we have found that smoke will cut down the heat flash danger radius of an atomic bomb explosion. Our work has been concerned only with the A-bomb that is burst above the surface of the earth, and with reducing its heat outside of the immediate blast area. Surface detonations, depending upon the size of the bomb, will produce blast damage and radioactive contamination out to various distances, smoke or no smoke.

Incidentally, in another project we are studying the means of minimizing this widespread radioactive contamination, which also results from a surface or subsurface A-bomb burst. In these latter types of detonations the heat effect is much less than an air-burst, but it is still significant.

Knowledge of Weather Conditions Essential

A very important consideration in the whole problem is whether effective smoke screens can be set up over American cities in the event of impending atomic attack.

Planning for the effective coverage of cities by smoke screens requires an intimate knowledge of the local weather conditions. The wind direction must be known in order to predict where the smoke will go. The wind velocity is also important since it controls the time taken to achieve smoke coverage of the area and the amount of smoke present over a given area at any time.

The atmospheric conditions, and the wind velocity, are of conjunctive importance because they control the height to which a smoke cloud will rise. In turn, the height of the smoke screen will be of importance in the case of protection against atomic weapons because just as any smoke below the bomb burst scatters heat away from the ground, so any smoke above the bomb would serve to reflect the heat back to the ground in the same way that clouds reflect the earth's heat. Therefore, to achieve the maximum protection of the smoke screen, we feel it should go no higher than the 1,000 to the 2,000 foot level.

Thus, for the 100 or more areas in the United States which can be considered as potential targets for enemy bombers, weather studies will have to be made. In most cases, the weather data for a number of past years is available for the evaluation that will have to be made as a part of the study for each area.

As a preliminary step toward this part of the overall program, we have had an exhaustive study and meteorological analysis made for four large cities. The work was done by Stanford University under a contract with us. These four cities were picked for the study not so much because they are potential targets for enemy bombers, but because their weather situations from the viewpoint of smoke screening are typical of potential American targets.

These studies showed that at least two-thirds to better than three-fourths of the time throughout the year, protective smoke screens could be set up over the cities. However, even three-fourths of the time is not considered enough, so systems for setting up these screens are being studied which could provide a smoke blanket over an area in less than 15 minutes for more than 95 percent of the time.

A second most important consideration that will have to be included in setting up such a smoke protection plan for each city is the logistical effort—the personnel, the equipment, the amounts of fuel, the generator locations —that will be necessary to put the plan into operation. The logistical effort naturally has a direct bearing on the local weather condition. From past experience we know that screening large areas is possible. But it is only through much study and effort that we know just what is needed to screen any particular city. For instance, back in 1943, we ran a series of smoke tests in Norfolk, Virginia. From those tests we learned that we could screen a 40-square mile area with a certain number of generators under wind speeds that ranged from 8 miles an hour to 28 miles an hour, with an expenditure of less than 200 gallons of fog-oil per hour per square mile.

However, the results of the Norfolk trials may be of little value in planning a screening operation for a city such as Charleston, for instance. For one thing, the top-

ographical features of Charleston are much different from Norfolk, thus the wind conditions are different. It might be that we could screen 40-square miles of the Kanawha River valley with half the number of generators that were needed at Norfolk—or we might need twice as many. Each city will present a different logistical problem. For instance, the factors we might consider in an industrial area like Pittsburgh where the steel industry could very easily provide the basis for a protective smoke blanket, would not be present in Washington, D.C., where there is no heavy industry. These then, are the kinds of problems that will face the local Civil Defense authorities when they start planning for their areas anti-atomic bomb protection.

Evidence Indicates Great Value

We cannot, at this time, say that we knew *all* of the final answers to the optimum utilization of smoke to reduce the thermal effects of an atomic detonation. They must await the evaluation of the reports we will get from the final full-scale test conducted at the site of an atomic blast. Nevertheless, we have sufficient evidence to point out the great potentiality smoke screening has to reduce the size of the area affected by the heat flash from an atomic weapon.

The implications of this form of smoke protection are great. For it is one more step forward in carrying out the message of George Washington that "to be prepared for war is one of the most effective means of preserving the peace."

Our nation's primary active defense against attack by enemy bombers lies in the radar and guided missile screens, and fighter aircraft cover that ring our country. But, since no defense can be considered as 100 percent effective, we need a secondary defense also. Smoke screening is a passive defense measure that can reduce the effects of those few planes that do get through the primary defense.

Thus, we also make it plain to any potential enemy that his efforts to bomb our cities and industries will be highly expensive. For the number of planes that penetrate the outer ring of defense would be comparatively small to the large numbers of attackers; and the atomic bombs dropped by those few planes could lose as much as 75 percent of their thermal effectiveness if dropped into a smoke-blanketed area.

As engineers, scientists, and technicians you gentlemen can readily realize what the great heat from an atomic detonation would mean to an area like Charleston. You can also readily see what it would mean if this heat effect were reduced as I pointed out earlier.

It would greatly reduce the destructive effect to the plants and factories that are making Charleston one of the world's great chemical centers. For here, in the heart of West Virginia's great industrial strength, I have been forcefully reminded of how vital a contribution to national security is the inventive genius, skilled labor, and efficient management of the industrial complex that is Charleston.

From your plants and factories pour forth the products which contribute so greatly to the standards of living of our citizens, and also the essentials which help our Army—and all of the Armed Forces—to protect our democratic nation and its principles. Not only do your products strengthen and enhance our own military forces, but they also provide a sizeable proportion of the material strength of the armed forces of our Allies.

Must Protect Our Sources of Supply

Gentlemen, this evening I have only spoken of one example from the unique field in which the Army Chemical Corps operates. The amount of time, effort, and money that have gone into the study and research for this new use of smoke has been quite small compared with other projects we are carrying out. But in the end, it may be the most important contribution we can make either to prevent future warfare, or to assure victory in case there is a World War III. For the strength of our military forces will be measured in the strength of the productive capacity behind them if, and when, those who would destroy freedom decide to force the issue. The millions of dollars we as a nation spend for research and development of new weapons, new munitions, and new equipment for our combat units will be of no avail if we have not afforded our sources of supply a strong measure of defense against attack by the enemy.

In smoke we have a measure that provides an additional defense against the effects of nuclear weapons, which assists in bringing into balance our forces of defense as opposed to offense.

Dr. Harold C. Weber

ADVISORY COUNCIL

Dr. Harold C. Weber, professor of chemical engineering at the Massachusetts Institute of Technology, has been named chairman of the Chemical Corps Advisory Council, succeeding Dr. Allan P. Colburn of the University of Delaware who died on February 6.

The Chemical Corps Advisory Council is composed of outstanding scientists and other specialists from leading educational and scientific institutions who advise the Chief Chemical Officer on matters pertaining to scientific research and development or engineering work of the Chemical Corps.

Born in Boston in 1895, Dr. Weber received a Bachelor of Science degree from the Massachusetts Institute of Technology in 1918 and a Doctor of Science degree from the Edgennosiche Technische Hochschule, Zurich, Switzerland, in 1935. He served as a second lieutenant in World War I (1918-1919) with the Army Chemical Warfare Service. He was a consultant with a Boston firm from 1919 to 1920 when he came to his present post with MIT.

During World War II, Dr. Weber served as a technical adviser to the Chemical Warfare Service Development Laboratory. He was awarded the Presidential Certificate of Merit.

Dr. Weber is a fellow of the American Association for the Advancement of Science, a member of the American Chemical Society, the American Institute of Chemical Engineers, and Sigma Xi.

JAPANESE PAPER BALLOON WITH BOMB FOUND INTACT IN ALASKA*

THE ESKIMOS are all agreed that it's a cold day in the Arctic when the barren tundra yields a Japanese balloon. But only recently the U.S. Air Force recovered just such an object, still intact with its bomb load, after exposure for more than a decade to the rugged Yukon climate.

Flying low between Barter Island and Fort Yukon, Don Hulshizer, Chief Bush Pilot for Wien Alaska Airlines, Fairbanks, Alaska, spotted a dull white object on the ground near the Scheenjek River. Because of the rough terrain he was unable to distinguish the object clearly. He reported the find to Ladd Air Force Base near Fairbanks. Air Force Officers there determined that the best chance for recovery of the object lay in a helicopter operation. The 74th Air Rescue Squadron at Ladd supplied an H-5 Helicopter as well as an SA-16 aircraft to fly protective cover on the 230 mile trip. Aboard the helicopter assigned to recover the object was Lieutenant Harold L. Hale of Pueblo, Colorado, of the 5004th Air Intelligence Squadron at Ladd AFB.

Once at the site, the H-5 found landing impossible, but Lieutenant Hale managed to jump safely to the ground. The dense underbrush and marshy tundra made walking extremely difficult and Hale had only 30 minutes in which to investigate and recover the strange looking object because night was falling fast. The 30 minutes gave the helicopter pilot time to set down a safe distance away, conserve fuel and then return to the site to pick up Hale.

First Thought It A Parachute

"After coming upon the wreckage, I at first thought it was a parachute," Hale reported. "But after discovering that the 'chute' was made of a kind of rice paper and the gondola contained some bamboo parts, I knew we could be reasonably sure it was of Japanese origin."

Hale bundled up the rice paper balloon and stuffed it under a tree so that it would not be reported again as an unidentified object. "Gathering up about 120 pounds of the remains of the strange product in my arms," he said, "I stumbled across the slimy tundra to reach the helicopter which was hovering just inches off the deck."

The odd find was transported back to Ladd Air Force Base where a thorough investigation of the Japanese balloon-carried bomb was made.

It was determined that the airborne device was similar to Japanese balloons found floating over the western regions of the United States during the latter part of World War II. It had apparently blown across the Territory and finally came to rest at this spot, north of Ft. Yukon, where it had remained undetected for the past nine or 10 years.

Lauding the cooperation and flying proficiency of the 74th Air Rescue Squadron, Hale said, "Without the use of the 'copter, the only way of recovering the balloon would have been by river boat, requiring five men and five weeks' time." Hale also had high praise for the skill of the 'copter pilot, Lieutenant Louis F. Wells of Quitman, Georgia.

Ingenious Construction of Weapon

The 300-pound weapon consisted of two principal parts, a metal gondola suspended by shroud lines, and a gas-filled balloon. The balloon measured approximately 32 feet in diameter and was constructed of rice paper, so durable that it could not be torn apart by two men pulling at it. The gondola consisted of a chandelier-type frame from which were suspended more than 30 paper sandbags used as ballast. The gondola also contained a bomb hook supporting a Jap 5KG Thermite Incendiary bomb 16 inches long. It was found that the bomb was still highly explosive and dangerous even after arctic exposure for nearly a decade.

Once balloons were launched from Japanese bases, the prevailing winds carried them for great distances. When the floating weapon reached a certain pressure altitude, gas would commence escaping from an outlet valve causing the device to descend until one of the five-pound sandbags was automatically kicked off by an electrical charge. With the release of this ballast the balloon would once again begin ascent and its forward movement. It would continue to rise until it reached a pre-established altitude, whereupon it would descend, kick off more ballast, and repeat the process until finally all ballast had been spent and the bomb released. Then the balloon would again rise and after a predetermined time it would completely destroy itself by means of a self-contained detonator.

World War II Air Corps pilots on the Aleutian Chain reported shooting down as many as eight or ten of these balloons a day. Although these floating incendiaries were found as far east as Iowa and as far south as Mexico, this bomb is the first to be reported found this far north. It has since been sent to the Air Force Technical Museum at Dayton, Ohio, for display.

Summing up the incident, Lieutenant Hale emphasized the significant role which the Alaskan bush pilot is playing in the defense of America's northern ramparts.

*Condensed from an official release.

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She shot the ashes off the Kaiser's cigaret

Her name was Phoebe Mozee and she was born in Darke County, Ohio, in 1860, and she could shoot the head off a running quail by the time she was twelve years old.

Once, at the invitation of Kaiser Wilhelm II of Germany, she knocked the ashes off a cigaret while he was holding it in his mouth.

When she out-shot the great exhibition marksman, Frank Butler, he fell in love with her and married her and they were ideally happy together for the rest of their long lives.

She could handle a rifle or a six-gun with an artistry unsurpassed by that of any human being before her time or, probably, since. And when she appeared with Sitting Bull and other notables in Colonel Cody's Wild West Show, she thrilled your father and mother —not as Phoebe Anne Oakley Mozee but as "Little Sure Shot," the immortal Annie Oakley.

Annie Oakley, the poor back-country orphan girl who made her way to world-wide fame, was the very spirit of personal independence. That spirit is just as much alive in our generation as it was in hers. It is among the great assets of our people—and our nation. And it is one very great reason why our country's Savings Bonds are perhaps the finest investment in the world today.

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THE PROTECTION OF STRUCTURES AGAINST CBR ATTACK

(Excerpted from an address on April 12, 1955, by Colonel Donald H. Hale, Deputy Commander, CmlC Research and Engineering Command, Army Chemical Center, Md., before the Los Angeles Post of the Society of American Military Engineers, in which he tells of important new protective construction material—diffusion board.)

Colonel Donald H. Hale, native of Rumford, S.D., holds a B.S. degree in chemistry and mathematics from York College, an M.S. in physics from Nebraska University, and a Ph.D. in physics from the University of California. Called to active duty in 1940, his World War II assignments included that of Chief of the Field Service Branch, Chemical Corps School, and Chief, Chemical Committee, Infantry School during the war period. In 1945 he returned to civilian life and for a year was Research Physicist with Douglas Aircraft and the following year he was a Research Associate at Northwestern University. He was recalled to active duty in 1947 and integrated into the Regular Army. Since then he has served as Chief of the Radiological Defense Branch, Chemical Corps School and was Commanding Officer of the Dugway Proving Ground before coming to his present assignment. He is a member of the American Physical Society and the Society of Sigma Xi.

. . . It should be quite obvious that the advent of the atomic and thermonuclear weapons has made it possible for one airplane to carry more potential destructive energy to a target than could be carried by a fleet of airplanes during the last war. The power of weapons of this type would probably be used primarily to damage a nation's producing power by wrecking its production facilities, but Hiroshima and Nagasaki proved that the civil population also suffers greatly.

There are other weapons which have the capability of reducing the effectiveness of the civil population without attacking and destroying the plants in which they work. As is the case for the energy-producing weapons, a revolution in the design and power of these weapons has been going forward. The power of these weapons to reduce the civilian worker's ability to produce has been greatly extended in the past few years. I am referring to the family of chemical and biological type weapons. And one cannot in this connection overlook the effects of the purely radiation hazard, as contrasted with the energy hazards of the thermonuclear explosion.

Biological weapons have never been used in modern warfare. The chemical weapons were extensively used in World War I and, as used, they were powerful weapons. The modern airplane makes it entirely possible to carry this type of warfare to the civil population. . . . If modern chemicals are released by the use of the modern airplane against civilians crowded into cities, can there be any doubt that a serious problem will exist?

The modern war gas or chemical agent is extremely dangerous to the unprotected or poorly protected individual even in very dilute clouds. But the biological agent is dangerous in still weaker concentrations. Said differently, the logistic effort required of the air arm to lay a dangerous cloud of one of the biological agents over a city will probably be much less than that required for the chemical cloud.

There have been disquieting reports in the public press recently concerning the hazards due to the fallout of radioactive materials following a thermonuclear explosion. I mention this in passing since the engineering problem of protecting facilities against these materials is, at least in part, similar to the problem of providing such protection against chemical and biological agents and radiological particles which can be disseminated by means other than atomic bombing.

These CBR weapons, that is the chemical, biological and radiological weapons, have one common property that might well make them attractive to any power bent upon a war of conquest. They have as I previously stated, the power to reduce the production capacity of a nation by striking at the workers. . . .

This then is the problem. What can be done to reduce the effects of any type of CBR attack against a city? The Army, in such studies, breaks down the problem into two parts. . . . individual and collective protection. Individual protection consists of those procedures and devices which the individual has and which he uses . . . The prime example is the protective mask. Collective protection embraces those procedures and devices which are used to protect a group and/or facilities. Thus, proper arrangements might be made so that air, filtered to remove any CBR agent, would be fed to the surgery rooms of a hospital. This would be a collective protection procedure. It is obvious that the collective protection means are largely engineering problems.

The filters used in collective protectors . . . are of two types—particulate filters and gas filters.

The particulate filters must be capable of stopping aerosols (either liquid or dusts) in a range from a few microns in diameter to a small fraction of a micron. Aerosol filters are not sieves or screens which stop larger particles and let through smaller ones. Construction of such a filter is possible but impractical since it would offer too much resistance to the flow of air. Therefore, mechanical filters must be of open construction, with openings which are large compared to the size of particles to be removed. Since removal of particles is dependent upon those particles adhering to a surface, a large num-

ber of fibers is necessary to give a large surface area and thus to produce an effective filter. Small fibers are more effective than large fibers in collecting particles from an air stream. . . . However, a filter composed entirely of smaller fibers will closely pack and have a high resistance. To avoid this high resistance, a loose network of coarser fibers is used as a support for the smaller fibers. Such a filter is efficient, has low resistance and low penetration by small particles. Current military filters are made of a single thickness of a material which is essentially a thick paper, similar to blotting paper. The fibers and processes are those used in paper making, and asbestos usually supplies the fine fibers that are needed. Since the sheet is much thinner, and therefore denser, than a pad filter, its resistance per unit area is much higher, and a greater area is required. In order to provide a large area and the necessary air passages, with a minimum total volume, the paper is pleated, and corrugated kraft paper separators are inserted between each pleat. These separators hold the pleats apart to allow the free passage of air through the filter material.

Particulate filters having air filtering capacities of 600 to 5000 c.f.m. are entirely feasible. . . .

To protect against gases and vapors, a gas filter is necessary. Activiated charcoal is used to adsorb toxic gases and is basically the same as the activated carbons used for decolorizing and deodorizing purposes and for the recovery of solvents. Toxic agents of low volatility and complex molecules are well adsorbed or retained by activated charcoal. Highly volatile agents made up of light molecules are not, and it is necessary to provide some means other than physical adsorption for their removal. Present practice is to use activated charcoal that has been impregnated with various reactants and catalysts.

The large gas filters are composed of a stack of trays containing charcoal cells. For each size filter, the appropriate number and size of trays are stacked, with spacers between them, and sealed in a plywood outer case in such a way that air can pass through each charcoal cell in parallel.

Like the particulate filters, the gas filters have filtering capacities ranging from 600-5000 c.f.m.

To provide complete protection against the hazards of chemical, biological and radiological contamination, it is necessary to use both types of filters.

The collective protectors, which are used for fixed installations are composed of these filters, combined with the required means of moving air through the filters.

In case of an attack employing CBR agents, either singly or in combination, protection will be needed not only for military installations but also for manufacturing facilities, hospitals, civil defense headquarters, and the home. I would like to examine what we need and how existing structures can be modified to provide adequate protection.

It has been determined that a man at rest can exist with only one cubic foot of purified air per minute, while a man engaged in light work requires a minimum three c.f.m. However, in a shelter equipped with collective protectors the suggested maximum of air is 10 c.f.m. per occupant and a volume of 250 to 350 cubic feet of space per person. Such conditions will permit considerable activity with comfort to the individual. Thus, the current standard collective protector, which supplies air at the rate of 300 c.f.m., will be adequate to provide the maximum air requirement to 30 occupants.

In an ordinary shelter, the constant introduction of sufficient purified air will prevent intolerable increases in temperature and humidity. In buildings where sensitive equipment is housed, humidity may be controlled and high temperatures avoided through use of commercial air conditioning equipment. . . .

As you can see from the figures given above, none of the collective protectors is large enough or has the capacity to handle large installations. Even with 5000 c.f.m. capacity a great number of protectors will be needed for most industrial concerns, or hospitals, or any large building. However, by using a number of collective protectors, existing facilities can be modified to protect against CBR agents. It is obvious that with the engineering data for the filters at hand, a protector of any capacity can be designed. . . .

The first step in modifying a suitable existing structure will be the determination of the number of protectors needed. . . . In determining this, the size of the shelter area, the number of people and the amount of activity necessary during the period of contamination will have to be considered. In addition the collective protectors must be installed where they are shielded against blast effects. If the protector uses a gasoline engine as a source of power, it is desirable that the protector be installed outside the main shelter because of the heat generated. If it must be inside, an engine exhaust must be provided. Since the engine will also consume large quantities of purified air, the collective protector should not be run in the pressurized area. The collective protector engine can operate efficiently on contaminated air.

Entrances must be protected as much as possible from the full impact of blast and fragments, for damage will allow contaminants to enter the shelter. . . . An air lock is a definite requirement if entry into or departure from a ventilated shelter is to be made without complete loss of pressure. The loss of pressure would result in an infiltration of contaminated air during a CBR attack. . . .

Buildings which are modified must be made as gastight as possible. The amount of work required will depend upon the type of structure selected and its condition. All windows should be removed and the openings sealed and sandbagged. The sealed window openings should be as strong as the supporting walls. All holes, cracks and openings should be sealed or calked with materials such as asphaltic compounds or commercial calking compounds. Masking and other types of tape make effective sealing materials. Putty, mud and other materials which shrink upon drying and are subject to displacement by blast are not satisfactory.

Inside the shelter it will also be desirable to provide adequate air circulation, anti-back draft valves, air pressure regulators and gages, air deflectors and fans. In addition, the protection provided by the collective protector is dependent upon the positive pressure of filtered air maintained within the shelter. A slight positive pressure will prevent the diffusion of contaminated air through small unsealed openings. For adequate protection the draft gage or manometer within the main enclosure should show about one inch of positive pressure.

You are probably thinking that all this sounds costly and time consuming. Taken by itself it may be, particularly if the structure you plan to make safe is a large industrial plant. One collective protector with an air filtering capacity of 5000 c.f.m. cost the Chemical Corps about $3,500. One must add to the cost of the protectors, the cost of sealing the structure and providing the required special entrances. It will cut the expense and make the job easier if the facility is already equipped with air conditioning.

It is also possible to reduce costs if the need for collective protection is taken into consideration when a structure is being designed. . . . A new chemical laboratory was recently completed at the Naval Research Laboratory in Washington. This structure has no win-

dows. The air is completely filtered to remove all agents; air locks and other devices necessary to afford complete protection have been installed. Yet, the Navy states that all this has increased the construction costs only by 5%.

This is certainly a very slight additional cost factor. And I would like to point out that even the money expended to convert existing structures would be negligible compared with the resultant saving to our economy if industry could continue to produce during and after attack. Add to this the value of preserving life . . . and the cost appears even more reasonable.

I have explained in some detail the mechanical collective protection which can be adapted to civilian use.

Now I want to give you some information on a new development—a non-mechanical collective protector which is easy to install, is quite inexpensive and affords complete protection against chemical and biological agents and atomic dust. The device is commonly referred to as the diffusion board.

Two types of materials have been developed, to date, for use as diffusion barriers. One is a semi-rigid board, about one-quarter inch thick, and similar in appearance to a commercial wallboard. It can be inexpensively produced on the standard commercial machinery. . . . It is also readily adaptable . . . in that it can be sawed, planed, sanded and nailed. The second barrier material is a flexible mat manufactured by a special dry-forming process. It is also about one-quarter inch thick. This material has found considerable use . . . where it is necessary to apply a barrier to irregular or curved surfaces, and where it is desirable to join the barrier to impermeable materials used as liners.

The direct inclusion of activated and impregnated charcoal in the composition of the above materials insures excellent gas arresting properties, and their aerosol removal efficiency has never been exceeded by a forced flow filter. Purification of air is accomplished by inward diffusion through the barrier. Outward diffusion of carbon dioxide and water vapors occurs simultaneously.

This principle of diffusion might be compared to the industrial use of energy sources freely available in nature. For example, manufacturing costs are greatly reduced by industry when maximum use is made of gravity flow processes, such as in the design of hydro-electric plants. It is also possible to achieve a protective system which is essentially power-free, in which concentration gradient acts as the sole driving force, and transfer per unit time of a gas or aerosol across a boundary surface can be controlled by either increasing the area of the barrier or decreasing its thickness.

The basic principle in the design of a diffusional protective device, whether for a single person or a group of individuals, is to surround or inclose the protected area with a sufficient quantity of barrier material to assure adequate protection and sustain life. Rooms or structures must be sealed so that the only means of exchange of air with the surroundings is through the barrier itself. Practically, it has been determined that, with the diffusional material available, protection can be achieved by the use of very small barrier areas, and the main concern in design is satisfaction of the physiological criteria. In this respect, we have determined in the laboratory and verified by actual extended occupancy trials, that the provision of about ten square feet of barrier surface per occupant is sufficient to maintain the equilibrium carbon-dioxide concentration at or below the innocuous value of two per cent. The other factors such as temperature and humidity fell within the limits of physiological acceptability during these tests.

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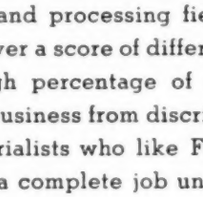

A salute to the A. F. C. A. . . .

Cleveland—headquarters of The H. K. Ferguson Co.—plays host to the Armed Forces Chemical Association at its 10th annual meeting, June 16-17, this year. We pay tribute to this association for its fine work and wish it continued success.

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While security limitations do not allow a full revelation of the specific methods and types of application we have been actively investigating, it can be stated that these diffusion materials have been used with success in the modification of protective devices, and have allowed us to consider collective protection for shelter types which were economically not feasible by conventional methods. Inside surfaces of shelters can be lined and windows replaced with the rigid board material or small enclosures constructed within a room and fitted for emergency use. In most cases the conversion of a room, house, bunker, etc., to a protective shelter can be accomplished by the occupants themselves, and the normal function of the protected area need not appreciably be altered by such treatment.

As you can see, there are some definite advantages to the use of this diffusion material. No special equipment is required to produce it; it is estimated that the cost per square foot will be about ten cents; nearly anyone can install it; and it is versatile. Structures protected in this manner will not be as comfortable for long periods of occupancy as those equipped with mechanical protective collectors, but they will afford protection when needed.

A series of occupance trials have been conducted in a cubical shelter seven feet on a side constructed of diffusion board material. The outer panels were diffusion boards which were nailed to an inner framework. Masking tape was used to provide leakproof seals. The shelter was provided with food, bedding and sanitary facilities for a two day occupancy.

One of the main indices used to determine occupancy conditions was the carbon dioxide percentage within the shelter, and its rate of build-up. Using about 10 square feet of diffusion board per occupant, the maximum CO_2 level was about 2%. So long as this 2% level is maintained, conditions will be tolerable for most individuals and occupants will be able to work efficiently. The rate of build-up was rapid compared with the stay of occupancy usually reaching a plateau after three or four hours. The maximum CO_2 percentages varied inversely with the area of diffusion board per occupant.

Equilibrium conditions were also reached within a few hours in regard to the temperature and relative humidity differential between the air inside and outside the enclosure. Over a wide range of test conditions the average rise per occupant was 3.3°F in temperature and 13% in relative humidity.

These are the means we have or are developing with CBR agents. The possibility of such an attack and the means of protecting against it should be taken into consideration in the building of new facilities. Present structures should be examined with an eye to making them safe.

NEW LIFE MEMBER

President Prime and the officers of the Association wish to announce the taking out of a life membership in the Association by Lt. Col. William B. Keller, 107 Calhoun Road, Clemson, South Carolina.

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MILITARY PROCUREMENT AND INDUSTRY

A Lecture at the Industrial College of the Armed Forces

By

WILLIAM D. WILKINSON

Monarch Aluminum Manufacturing Company
Chicago, Illinois

(This address, given on Feb. 7, is printed here by permission of the author and the Commandant of the College. In the first part Mr. Wilkinson draws upon a survey of industry's views on government procurement procedures, which was made in 1953 by the Midwest Chapter of the A.F.C.A. An article by Mr. Wilkinson reporting that survey in some detail was published in the July 1953 issue of the Journal. The second part of the address citing opinions of industry on the new logistics organization of the Army is based upon another survey of industry made recently by the Midwest Chapter. In view of the interest which has been taken in this survey, further exploration of industry's reactions is being made by the chapter in order to prepare a more detailed study.)

Mr. Wilkinson, third vice president of A.F.C.A., is also vice president of the Midwest Chapter. He was born in Michigan City, Indiana, September 5, 1910. He attended the University of Iowa, University of Hawaii, and Armour Institute of Technology. During World War II he was senior field service representative for Stewart-Warner Corporation and after the war was with the Chicago Railway Equipment Company as assistant to the Executive Vice President before joining the Monarch Aluminum Manufacturing Company. He has served on the Industrial Development Committee of the Chicago Association of Commerce and Industry for many years and has acted as advisor to the Director of the Senate Small Business Committee. Mr. Wilkinson is interested in lions and devotes a part of his spare time in the lion house at the Chicago Zoo. (Picture above was taken at the College).

I—PROCUREMENT

IT IS AN HONOR to visit the Industrial College of the Armed Forces, and it is a wonderful pleasure to bring you the greetings of the Industry. Its members look to this College for the men who in the future will wrestle with the problems of procurement. The Staff of the College has asked for an expression of what industry thinks of procurement. Today I shall outline for you some of this thinking. Since my invitation to speak to the College, I have visited and talked, not only with industry, but with procurement people in all branches of the Department of Defense.

In my conferences with other services than the Chemical Corps, I found the reactions to be almost parallel with those reported in the two surveys you have.* The survey on industry's reaction to procurement was presented to the Commission on Organization of the Executive Branch of the Government and, under the date of December 6, 1954, the Commission reported to me that they found no significant differences in the replies they had received to their questionnaire on government procurement. I feel that there are certain points that should be highlighted in order to present a conclusive picture on procurement, and these points follow.

*An article by Mr. Wilkenson "Industry's Reaction to Government Procurement Procedure" was published in the July 1953 issue of the AFCA JOURNAL.

Bidders' List and Understanding

At the embryo point of procurement, which is at the time a potential contractor seeks out an agency and desires to get on the Bidders' List, it is of extreme importance at this particular stage that there is a clear and clean understanding about what the potential contractor has to sell and what the potential buyer has to buy. Longfellow, in his great wisdom, perhaps understood this situation when he said, "We judge ourselves by what we feel capable of doing; others judge us by what we have done." Gentlemen, I would encourage you to be very explicit on this point that there is a complete understanding on the part of each party as to what is required in order to be on the Bidders' List. Industry must recognize that they must be more truthful and factual as to their qualifications at this point, and the contracting officer, because he is a public servant, does not necessarily have to be a "yes" man and place them on the Bidders' List and send them home temporarily happy. In talking to representatives of both the Senate and the House, I asked them what was the largest complaint against procurement that they received from their constituents, and it was amazing that they all replied that their constituents came to them and complained that they could not get on the Bidders' List. Gentlemen, if you want to cooperate, make sure that the potential bidder or the potential contractor, understands WHY, if he is not on the Bidders' List.

To formulate a bid, industry asks for only that amount

of time in which they can formulate their best bid. For any item it would be well for the procuring agency to review past histories of that item, or a like item, and consult with their staffs before they place a time element on the bid. Granted, there are times when you have to have that bid in a hurry; but at those times make sure that there is time for a good bid. Sometimes it's difficult to get prices together that are the best prices, for, bear in mind, the prime contractor has to investigate and know the sources that are bidding to him on components. This is so that when he puts that bid in he has full faith that he will be able to produce the item in accordance with the contract which he will sign with the government if he is the successful bidder.

Understanding of an invitation to bid can involve a lot of difficulty and confusion. There are many who say that a meeting should be held of the bidders and at that time the procurement agency should explain the bid to them. This would be costly in that many people would have to travel long distances to attend such a meeting. There are those that say, "I will call up Captain So-and-So on the telephone and discuss this bid with him." But the simple solution to the whole problem is—make every effort possible to simplify the wording of the invitation and specifications; adhere as nearly as possible to conventional, standard terms and specifications. One thing industry asks, with the full realization of security measures necessary in some cases, is that wherever possible the use of that item be fully explained; for, if industry knows what you are going to do with it, they have a pretty good idea of how to interpret your specifications, and also how to make recommendations on an alternate bid which might save you some money. That is providing the procurement agency can get action on these suggested changes in a period of time that will allow the changes to be incorporated into the contract, or even considered at the time the bids are evaluated.

Advertised Or Negotiated Contracts?

I can think of no subject that creates more discussion than when you ask, "Which do you prefer, advertised or negotiated type contracts?" One type of business will tell you that they want advertised bids because they get the best breaks on them. You will find others that definitely want negotiated bids. There is a definite place for both types of contracts. There are definite disadvantages to both types of contracts. It seems that industry prefers the advertised bid for, as the manufacturer calls it in his vernacular, an "off-the-shelf" item—or perhaps in the military lingo it is a "simple" item. But, in the case of a complex military mechanism, industry prefers the negotiated bid because then the complete story is analyzed step by step, and there is a complete understanding on the part of both parties, industry and the government. A word of caution: There have been a few cases reported where the contracting officers will use a negotiated bid to hammer a price down, until it is hammered down to the point where it is no longer a sane or a sensible bid—and industry does not like that type of ethics—even though they use it themselves, they don't like to have it used on them.

In reference to the subject of schedules, there must be a factual understanding of this problem. At the time of the bid, the material is wanted, for example, 90 days from the time of the contract. It is important to take into consideration that there may be components involved that, at the time the component sub-contractor bids for the job, he can agree to supply, in 60 days if he receives the contract. But, if there is much delay in placing the contract, the schedule becomes unrealistic. That must be taken into consideration in establishing schedules. There are many other points involved, too,

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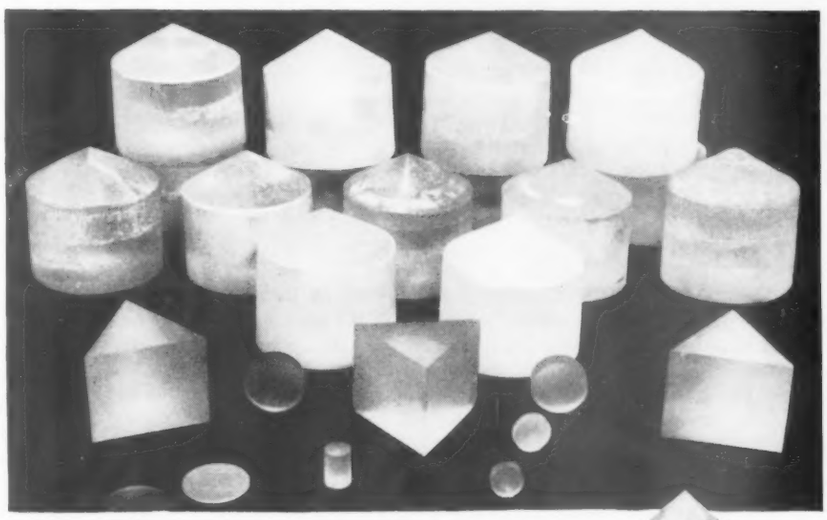

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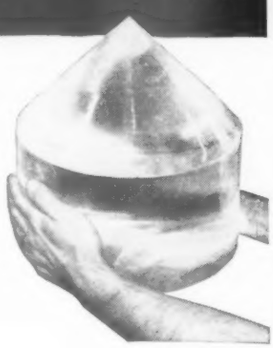

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such as the problem of getting a new item into production. It is the recommendation of industry that the first period of a schedule take into consideration how much time will elapse from the time the bids are opened until the contract is awarded. This time element should be known by the bidder at the time he is interpreting the schedule requirements. Second, it is important that schedules should be realistic and that the government actually wants the material to schedule. Industry asks that you study the scheduling very factually, and especially the first portion of that schedule.

Evaluation of Bids and Facilities

In discussing the problem of what constitutes a successful bidder, the law says "the lowest qualified bidder." Here I think it is important to point the finger right square in the face of industry and say that it is their job to keep on selling their facility at the time of the plant evaluation, and to lay out factually how they propose to do this job, and make available all facts and all records, and go into as much detail as is necessary for the successful presentation of their facility to merit the contract. It is not the duty of the person visiting that plant as a representative of the government to evaluate that plant and try to sell it back to the government as a good facility on his own initiative; and, likewise, it is not the job of the various agencies of the government to step in and do that for the contractor. If that is their job, then, all a man has to do is to take his bid over to that agency and say, "Here, Buddy, you take it from here, and bring me back the contract. I'll sign it." When the government provides a sales agency for selling to the government, they are going to be so busy they won't know where they're at. One point industry would like. They would like to know, at the time of the plant evaluation visit, what things there are about their facility that will be to their disfavor. If it is the bidder's finances, the government representative should say, "Now, your financial position does not look too strong." If it is his facilities, the government representative should say, "Your facility to produce this item, in my opinion, is not adequate."

Industry asks that they be allowed to sit in on the final determination of their plant evaluation, especially if it should be in disfavor.

Another phase industry would like to know about from all services is how they made out on the bid. It is of extreme importance to you, gentlemen, that they know that fact, for, if a man bids on a given item at a price of $10.00 and he had the facility to produce that item, and the contract was let to someone else for $9.65, perhaps the next time that item came up, based on the knowledge that he was 35c high, he could go back and restudy his bid and come back to you with a price of $9.50, or $9.40. It is of the utmost importance for bidders to know why they lost the contract.

Furnished Equipment, and Priorities

In respect to government-furnished equipment—and that is another subject on which we could spend a good morning—it is of extreme importance that the potential bidder be given opportunity for inspection of that equipment. That is a practice you gentlemen follow. The one practice you don't follow is that you don't give the *history* of that piece of equipment. How many parts did it produce? Were there any problems in dealing with that particular equipment? Industry looks upon government-furnished equipment like a car in a used-car lot. It can look awfully good until you drive it. It's very, very hard by just looking at a piece of equipment to judge it in light of a competitive bid and say you can produce X number of pieces from that equipment satisfactorily. Give them the history of that equipment! This is very important.

In respect to critical material in a mobilized economy, make sure that the contractor is supplied assistance in order to get that material, for bear in mind that all a priority is, is a ticket to get in one line instead of another. It just determines what line you can get into to get up to the gate. Take those factors into consideration, and also take into consideration, on a very important contract, that the contractor has the facilities and the normal avenues to obtain material. There is nothing like a firm getting a contract and then getting a priority that he doesn't know how to handle. All he has is a hunting license to go hunting for an item.

Views About Government Inspectors

In respect to inspectors, it is high time that more recognition is given this particularly important phase of a government contract. An inspector is charged with the responsibility to see that the government receives material in accordance with given specifications, but those inspectors have got to be allowed a little latitude to interpret the borderline situations, and they have to look at something in the light of whether it will function—and, will it perform the assigned mission, and will it be safe. Gentlemen, I have seen, in many plants, government inspectors working side by side with chief inspectors, members of industry who were receiving twice as much money as the government inspectors, and personalities were bound to enter into the picture—the human element. I have also seen where inspectors were smug in their authority and delighted in using it. If it is necessary to increase the civil service rating of inspectors so that they do a good job and have a broader background, and are better equipped to handle the job, then that is what should be done. . . . One of the chief criticisms of inspectors is that they are afraid to make a decision. If this be the case, then their superiors should be readily available either to make the decision for them or to obtain a decision that is practical. Inspectors . . . must be true representatives of the government and conduct themselves as a credit to the government in all their actions and decisions.

Engineering Changes; Payments

Coming to the matter of engineering changes, there is much to be desired here. The complexity with which engineering changes are handled is a serious problem. Perhaps industry is impatient. They are used to operating from one company to another. They expect engineering changes, they get them, they put them into effect. It is a relationship generally between two chief engineers. However, in military procurement, there are many people involved, which is time consuming. Perhaps by setting up a strong engineering force within a procurement district, these engineering changes could be relayed faster and a closer coordination worked out at the contract level.

In respect to payment of contract, this also leaves a lot to be desired. A man generally has a lot of money tied up in a government contract, and he waits until the government is ready to pay. We are creatures of habit, and it's a habit of industry to discount invoices and argue about the details later, if there are any arguments. This, perhaps, is the reason why over 50% of industry criticizes the method of payment of government contracts. The complexity of paper work within the government structure is the cause for delay and this should be restudied and overhauled.

Speaking of mobilization planning, or whatever name you wish to use, this idea of planning took a terrific beating during the Korean action. There perhaps was a very

broad misinterpretation that the Korean action was a war and that this nation was totally mobilized. Many industries thought that because they had a mobilization contract to produce this, that, or the other thing, they were in the driver's seat and they should be off and running, which was not the case at all.

Mobilization planning is a necessity, as we are living in an era where, if an M-day should come. . . . there will not be time to *grow* strong. We must be ready to go when the whistle blows. A factual appraisal of this should be made so that each industry knows what it would be expected to do. . . . Industry must be made to understand that a plan in effect today may be obsolete in a year's time due to changes in methods of warfare. Programs should be instituted to review each company's status periodically in order that the concept of warfare and the probable changes of industry's facilities may be correlated.

In brief, gentlemen, that is the report of procurement as we know it, and a natural question for you to ask is: If doing business with the government is such a headache, why does industry do it? The answer is simple. Industry has no alternative but to do it, for, in our modern civilization we have our courts, and we are supposed to iron out our problems peacefully; but there are those who do not agree with this concept and feel that war and its destructive powers are the method of solving problems. There is much material required so that the sinews of war can be provided, and industry is called upon to supply these sinews, and materials become critical. A plant with its family of employees suddenly hasn't a thing to do unless it has a government contract. There is a patriotic spirit, yes. When our nation needs something, the record of industry shows what we can do.

II—ARMY LOGISTICS PLAN

In the second part of this talk—this is where I stick my neck out—I should like to bring you the reactions of industry to the reorganization plan of the Army for logistics. To our good friends of the Navy, Marine Corps, and the Air Force, this might not seem of particular importance at this time; but I would encourage you to glance back over the pages of history. In 1795 Congress passed the first law regarding the purveying of supplies to the government. Then, as we leaf over the pages of history we see that not until about the time of the Civil War were there any substantial changes made in that law, and we start to see from then on the power transfer from Congress to the Executive Branch of the government for the purchasing of supplies. We see the growth of the technical services within the Department of the Army, which was a movement in many minds toward the decentralization of huge buying power. As we leaf forward we see that World War I was primarily fought with foreign goods. Now, as we turn the pages to World War II, the tremendous economic productivity of this nation was brought to bear on the enemy. Procurement increased on a scale which would have been labeled fantastic by any forecaster.

Now, as we went across those pages hurriedly on procurement, let us go back and watch the growth of the services. We had the Army and the Navy. Then came the unification of the services and we saw the creation of the Army, Navy, and Air Force under the Department of Defense. While there are many in Washington today who would climb to the top of the Washington Monument and disclaim this loudly, there are just as many, if not more, who point down the road and say, "Some day there will be a fourth branch of the services—a Department of Logistics and Supply."

We have come in the past year to a major step in the reorganization of one of our defense services, and that is the reorganization of the Army, where in brief we create two teams—a fighting team and a supply team. There was a day when the logistics aspect of the Department of the Army was a small per cent of the team. Today logistics equals the fighting team.

Views of Industry Sought

Out in the Midwest, in Chicago, the Armed Forces Chemical Association has a chapter. They are about the most aggressive group of men you could ever meet. They sensed that this reorganization was a very important subject, and they invited the Honorable John Slezak, then Under Secretary of the Army, to come out there and tell the captains of industry, their members, and the heads of the military services in that area about this reorganization. The talk raised a great deal of interest, and the thought came: What does industry think of it? They commissioned me to find out what industry did think of the reorganization in respect to logistics.

In reporting to you today on that survey I wish that you would hold in your minds the thought that, while many of these comments may seem negative to you, remember they were asked for their frank opinions. They are not meant to be critical; they are meant to be constructive; and out of this seeing ourselves as others see us something constructive may come.

In regard to the plan itself, let me tell you a few comments relating to the over-all plan.

The President of one company replied, "Any reorganization of the Army which would provide for a greater continuity of personnel and policy in procurement would be an improvement over the existing system. It would undoubtedly mean that the personnel would be specialized personnel for the purpose intended."

Another comment: "The concentration of responsibility for logistics and supply under the Assistant Secretary of the Army is an excellent move, and it is entirely logical."

It is not my intent to identify the authors of any of these comments; however, this next comment comes from a captain of an industry of some size and importance in the industrial world.

He commented: "In revamping the entire organization, they have put together a new concept of thought and action that should be more beneficial to the government of our country and to us as individuals. People

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sometimes criticize a large organization, but when you look over the stupendous size of the Army you will realize that the function of it far surpasses anything industry could conceive."

Question of Permanency in Top Positions

In industry's study of this plan they looked quite naturally to the top of the table of organization and moved over to the segment dealing with logistics, and here they raised a question: Can this job be done with the transitory type of office holder that has been occupying the secretarial level posts? If we are practical and honest we must agree that we have had many changes in our nation's capital on the secretarial level in the past years, and here we are charging a man to head up a multi-billion dollar program which in industry would take that man at least a year and one-half to get his feet good and wet before he struck out and started to make a showing. There must be some permanency in the people that are holding these responsible positions.

There were comments pointing out that our secretaries are appointed by the President and approved by the Senate. However, in many minds these are political appointees and it would be exceedingly hard for the man that heads the logistics function to forget the road that took him to the secretaryship and to look at it strictly as a great big job to be done without personal feeling, and with the strength to rise above the petty animosities and pressures that will be brought to bear upon him.

In respect to the military personnel that will fit into the logistics scheme of things, I would like to give you a few of the comments that illustrate this aspect of the plan.

One comment: "Perhaps the most common cause of complaint in the procurement work of the services in the past has been the assignment of officers who were unsuited to this type of duty either by training or inclination, and consequently have caused some irritation."

Another comment: "We in industry cannot expect our Vice Presidents of Engineering or their staffs to be as thoroughly trained in the business world as our Vice Presidents of Material and their staffs. If we cannot blend these two together, how does the Army expect to use a man for a few years as a fighting machine and then a few years as a logistician?"

Another comment: "If the Army system of using a fighting man as an executive is correct, then General Motors should hire Rocky Marciano as their President instead of Harlow Curtice."

New Concept of Responsibility

There were comments to the effect that, if the Assistant Secretary for Logistics and his Deputy Chief of Staff, in their decisions to place manpower and money on the assigned mission basis to the technical services—in the event that there is not adequate manpower or adequate finances, will they assume their responsibilities if the mission fails? For, bear in mind, gentlemen, this is a new concept; for, where in the past our technical services have operated on a resource controlled plan, in pattern of reorganization we are now entering into a performance of mission assigned program. There are many who feel that giving a man X number of dollars and X number of men, and the full responsibility for the success or failure of a mission, is an excellent thought; for this would put the challenge directly to the man and, if he is strong enough to carry out the program, he should be recognized for it; and if he is too weak to handle it he should be replaced. For here we see the growth of an idea that has long been the barrier to men of the services entering the field of logistics. Their work was not recognized and promotions were not based on merit. The logistics officer should have the same opportunities of advancement as the field officer. Granted, there are not the battlefield heroics in the battle of paper, but there are just as many challenges in the battle of paper as there are in the battlefield itself.

Perhaps one of the things that will be a contributing factor to the success of this program will be a strong civilian-military team, not only within the confines of the Pentagon and all the agencies down the line, but within industry itself. As long as military procurement follows the program now established of trying to pattern itself as closely as possible to American industry, the procurement advances made by industry can be reflected by the military quickly and with full effectiveness. This coordination, it is felt, can largely be implemented through the use in logistics planning of technical advisory teams from industry, such teams to operate on a two-way principle—to accept the problems brought to them by the military and at the same time to bring industrial problems to the military for a constructive interpretation.

Assistance to Government from Industry

Granted, there are many advisory groups and teams in existence, and many of them serving well, and many of the auxiliary associations of the various technical services have helped immeasurably their particular technical service. But I should like to encourage thinking along the lines of industry's full responsibility to these advisory teams. It is easy for a business man to sit back in his office and criticize the decisions and policies of the government, but, ask that same man if he could go to Washington and serve, and he will hide in the closet faster than if a lion came into the room. In his company, scarcely a month goes by but the draft board takes from his plant one of his employees for possibly two or three years, and he generally calls that employee in and makes quite a patriotic speech about it. Now, it's high time he put that same speech to work on himself; and, when the call comes for a technical advisor, he should serve, or make available his very best people. Maybe there is somebody in his plant who is not the best known man in the world, but he knows his business, and out of that individual could perhaps come some excellent thinking.

In the broadest aspect of this reorganization, while the present charts do not show it, the key to its success so far as the average industry is concerned is the strengthening of the district level of procurement; and I should like to read you a comment from industry on this aspect.

Decentralized Procurement Favored

"The central office, so to speak, should serve only two broad purposes. First, to disseminate the requirements and second, to act as a service agency in supplying the basic ground rules and up-to-date information. It almost always follows that, when Washington gets mixed up in procurement, confusion results. I realize that the political pressures to which the central offices are subjected by virtue of their location make for a difficult problem but it is strongly urged that the Army work toward making the Washington offices of all branches highly efficient service agencies to assist the field offices in the actual procurement work."

Another comment: "Let the ivory towers in Washington be the servant of the district offices in the field."

If the district office is properly manned, and the information to that district office is full and adequate, you will cut down the traffic to this capital so fast that the hotels will be meeting you at the airport and railroad stations looking for business.

In respect to strengthening the district offices and their corresponding points, a thorough review of their table of organization should be studied so that there is a complete team of legal, contracting, engineering, and production-planning personnel, and these offices should be manned by men who understand and know their jobs, whether they be military or civilian.

There were those who suggested that perhaps the civil service regulations could stand a looking into; that, if necessary to remove a civil service person, it could be done with something short of an act of Congress. Men of industry are very observing and, as they visit various government offices, they are always very much impressed by the fact that there are people apparently doing nothing, and there is another segment of people who are working sixty minutes an hour trying to make themselves something to do, and there are other people who are working 120 minutes an hour to do a good job for the government.

Eliminating "Influence Peddling"

If the district is strengthened you will eliminate one of the nuisances of industry, and, I believe, of yourselves; and that is the "influence peddler" as we call him in civilian life. It is funny that you can come to Washington and hear more rumors, and about half of them are true, and you can go back to the district office and say, "I understand there is a requirement coming up on such and such an item," and the district officer in full honesty will tell you that he doesn't know a thing about it. Only, in about two or three weeks, there it is! It stems from this, gentlemen—the average business man who cannot get what he believes to be the proper information at the district level, naturally turns to Washington for his answers. The complexity of the capital confuses him, and the public servant who, by virtue of his training, has developed an easy manner of meeting the public is a good listener who is glad to see his visitor, and is attentive to the views expressed, regardless of whether they are commendatory or derogatory. So, at the end of a day, the business man has talked to several people and still does not have the concrete information he was seeking. It is little wonder that he falls prey to someone who says he has connections and can get the answers this man is looking for; and in many cases he gets the answers or arranges an appointment with someone of authority who can advise the business man more thoroughly than he had experienced on his own efforts. Industry raised the question, "Why is it that these influence peddlers have access that is not extended to the average person?" It is obvious that, if the district is strengthened, this problem of the business man turning to the Hill for assistance will also be eliminated.

There were several comments asking for the small business agency to be outlined clearly and cleanly as to exactly what they are supposed to do, and can do, and will do, and how this will fit into the reorganization plan of the Army. Granted, at the present time the law is fairly well defined creating that agency, and granted, that in each of the many district offices there is a small business representative, but you can get more interpretations of what that representative is supposed to do than there is time in this address to cover.

There has been much in the press regarding mobilization planning, and the organizational charts that industry has seen of the reorganization, so far, do not show mobilization planning in them. It is the feeling of industry that some place in the organization of the Deputy Chief of Logistics a mobilization plan should be established that will cover all the technical services, in order to avoid an inter-technical service conflict over facilities. While a small per cent of industry does business with only one technical service, much of industry does business with two or more of the services. Earlier in this talk I outlined the suggestions of industry on mobilization planning, and it is the feeling of industry that these things should be taken into consideration in the reorganization plan and that there should be assigned definite specialized people on this program.

Views on Whether Plan Is Practical

In obtaining industry's reaction to the reorganization, one could not help but feel that it was quite natural to go back and ask industry this question: Do you believe this reorganization will work or not? Those that reported that the reorganization plan will not work based their arguments in general on the fact that, first, there is not available to the Department of Logistics a sufficient quantity of trained personnel to carry out the program as outlined. It would take quite some time to get a full staff of the caliber of people that are needed. There were those who studied the organization chart in some detail and pointed out that the Chief of Staff has access to the manpower and finances, as does the Assistant Secretary for Logistics, and it is quite natural that there is going to be a small scramble for manpower and money. It is only natural that the field commanders will want the very best men to wage warfare, and it is also only natural that the Secretary for Logistics will want good men, too. There are those who will tell you that the old-line guard will say, "Okay, we have to write our specifications so that they are simpler, and we have to streamline our practices, and we have to delegate more authority to the lower echelon—but why? We've been successful in all these wars! We have operated for years over this same route. Why should we change now?" And there will be those who will jealously guard their authority and responsibilities, and their assignment, and will not wish to mold themselves into the larger program. If any one thing will defeat the reorganization plan of the Army it will be this—the failure of the people involved to subjugate personal ambition to the fulfillment of the plan.

In respect to why the re-organization will work, one captain of industry pointed it out very simply. "It's got to work, for today, out of every tax dollars, 65c of it goes to national security in its broadest purpose. Where you are under pressure to reduce your budgets, there is only one way that you can possibly reduce them, and that is to become more economy minded. Economy is not the old dodge of lopping so many people off the payroll, but it is the institution of systems and programs that will get the maximum per dollar spent, which is the ultimate goal of this program."

In respect to the personal resentments of other people toward this program, it is almost inconceivable to see where this program does not afford them the opportunity to do many of the things that they have wanted to do for many years. To the tactical officer it presents the opportunity to continue in the field where his interests lie, and he will no longer be saddled with the responsibilities of logistics. To the technical services it offers an excellent opportunity to join hands on many projects and operate more compactly as a team, and it offers a splendid opportunity to the procurement personnel to accept the mission assigned to them and see the job to a successful conclusion; for in so doing their chances of recognition are greater than what has previously been the case. In many ways the reorganization of the Army is something that you ask industry to do constantly. You ask us to lower our prices to you. You ask us to sharpen our pencils. This is your opportunity to sharpen your own pencils within your own departments, which will eventually show up in a lower cost of military requirements.

We are in a time of highly specialized warfare, and logistics is definitely a part of that warfare. Perhaps the strongest reason why this plan will work is because of the international situation; for underlying the program there is the recognition that America does not have enough manpower to throw man for man against countries many times more populous than ours. America therefore must rely upon its productive and technological superiority for its first line of defense, and we must accordingly gear our logistics for this objective. If that is the theme of the reorganization of the Army, then the plan will work, for America has always stood head and shoulders above any other nation in productivity and in technical superiority.

Industry looks to you to establish a new concept of logistics that will make for better team work between the government and themselves, for America's strength lies in that relationship.

BY-PRODUCTS DISPOSAL

IN A TALK before the Chlorine Institute, New York, N.Y., on January 26 last, Major General Wm. M. Creasy, Chief Chemical Officer, explained procedures which have been adopted by the Chemical Corps for the disposal of by-products resulting from the operation of its Muscle Shoals Phosphate Development Works.

In the case of each of the four by-products involved he pointed out that procedures had been aimed at dealing with the disposal problems and conserving the interest of the government without at the same time having an adverse effect on the regular commercial economy.

Of the four by-products General Creasy mentioned, he stated that the only one which had caused much of a problem was phosphorous oxychloride. The quantity of this compound that was temporarily disposed of, General Creasy stated, represents a large percentage of the Nation's annual production so that special treatment was given to this problem in order to minimize the impact on the normal market. He stated that the Chemical Corps is endeavoring to avoid this disposal problem by applying conversion procedures so as to make use of the material and recycle it into the plant operations.

General Creasy stated that the Corps could find no military or government civil agency that had a requirement for phosphorous oxychloride so it became a surplus that had to be disposed of. "The initial trial carload of approximately 50 tons," he said, "went to the Montrose Chemical Company. Subsequent to this, it was determined that bidding through normal procedures by issuing invitations would not result in disposing of the necessary quantity in the required time. It was also realized that the quantity of the material we had to dispose of could cause a definite impact on the commercial market. Therefore, prior to negotiations for the disposal of this material, meetings were held under the auspices of the National Advisory Committee of the Department of Commerce with producers and consumers of phosphorous oxychloride. As a result of these meetings, a plan to restrict distribution to normal commercial producers of the material was recommended."

General Creasy listed specific reasons for the action indicated above, notably, minimizing the impact on business and employment and the fact that disposal by the government would principally affect the commercial producers of this product. Accordingly, he stated, the matter became one of cooperation with the producers helping the government to solve its problem.

General Creasy stated, "We have now completed the delivery of the quantities which were authorized when the problem first came up. Receiving these deliveries were: Monsanto Chemical Company; Victor Chemical Works; Oldbury Electro-Chemical Company; and Ohio-Apex Division of Food Machinery Corporation."

ATOMIC ENERGY AND CHEMISTRY

Dr. John C. Bugher, Director of the Division of Biology and Medicine, United States Atomic Energy Commission, in an address before the National Health Council, New York City, March 23, on future possibilities of atomic development said with respect to the chemical industry:

"In part, directly as a component of the atomic energy industry and in part indirectly related to it, there is occurring an equally impressive revolution in the industrial applications of chemistry. Through the utilization of chemical reactions at present not well understood, it appears very likely that the civilization of the future will be profoundly dependent upon the chemical industry. Direct chemical reactions, as well as atomic reactions in the solid state leading to direct conversion of radiation energy to electrical power, merge at many points to yield applications of great potential value. The chemist has become accustomed to producing and working with materials of exceedingly great purity and to separating substances present in minute amounts through continuous processes of increasing economy. While we may anticipate great improvement in the processing of atomic fuels, the same principles extend directly into such areas as the production of synthetic foodstuffs and the utilization of solar energy through the process of photosynthesis. Inherent are the prospects of new and greatly improved drugs for medical purposes and the production of compounds necessary to nutrition."

CHEMICAL CORPS TESTS

The Defense Department has announced that, starting in April, the Chemical Corps would conduct a series of tests of newly developed or modified Chemical Corps equipment and techniques for the protection against chemical warfare agents.

Twenty soldiers from the Second Army area are assisting in these tests which are designed to provide information which would reduce the chances of injury to military personnel in the event of an attack with toxic agents.

Recruiting programs to obtain additional volunteers needed in the test are to be conducted at various stations. Selected personnel, following a qualification test, will be assigned to the Army Chemical Center for 30 days' temporary duty. They will have the option of returning to their permanent units at any time.

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Barnebey-Cheney Company, Columbus, Ohio
Bayshore Industries, Inc., Elkton, Md.
BECCO Chemical Div., Food Machinery & Chemical Corp., Buffalo, N.Y.
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Benjamin Reel Products, Inc., Cleveland, Ohio
Blaw-Knox Company, Pittsburgh, Pa.
Blickman, S., Inc., Weehawken, N.J.
Bridgeport Brass Company, Bridgeport, Conn.
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Celanese Corporation of America, New York, N.Y.
Central Foundry Company, The, Newark, N.J.
Chamberlain Corporation, Waterloo, Iowa
City Chemical Corp., New York, N.Y.
Columbia-Southern Chemical Corp., Pittsburgh, Pa.
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Continental Oil Co., Ponca City, Okla.
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Empire Stove Company, Belleville, Ill.
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Evans Research & Development Corp., New York, N.Y.
Fairbanks, Morse & Co., Chicago, Ill.
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Ferguson, H. K., Company, The, Cleveland, Ohio
Ferro Corporation, Cleveland, Ohio
Firestone Industrial Products Co., Fall River, Mass.
Fisher Price Toys, Inc., East Aurora, N.Y.
Fisher Scientific Co., New York, N.Y.
Food Machinery & Chemical Corporation, New York, N.Y.
Foster Wheeler Corporation, New York, N.Y.
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General Aniline & Film Corporation, New York, N.Y.
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Goodyear Tire & Rubber Company, Akron, Ohio
Grace Chemical Company, New York, N.Y.
Gray Stamping & Manufacturing Co., Plano, Ill.
Gulf Oil Corporation, Pittsburgh, Pa.
Haertel, Walter, Company, Minneapolis, Minn.
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Heyden Chemical Corporation, New York, N.Y.
Hooker Electrochemical Company, Niagara Falls, N.Y.
Howell Company, The, St. Charles, Ill.
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International Salt Co., Inc., Scranton, Pa.
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Mason, L. E., Company, Hyde Park, Mass.
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Niagara Blower Co., New York, N.Y.
Nopco Chemical Co., Inc., Harrison, N.J.
Oldbury Electro-Chemical Co., Niagara Falls, N.Y.
Olin Mathieson Chemical Corp., East Alton, Ill.
Oronite Chemical Company, San Francisco, Calif.
Parsons, Ralph M., Company, The, Los Angeles, Calif.
Pemco Corporation, Baltimore, Md.
Penick, S. B., & Company, New York, N.Y.
Pennsylvania Salt Manufacturing Co., Philadelphia, Pa.
Pfizer, Chas. & Company, Inc., Brooklyn, N.Y.
Philco Corporation, Philadelphia, Pa.
Phillips Petroleum Company, Bartlesville, Okla.
Pittsburgh Coke & Chemical Co., Pittsburgh, Pa.
Rau Fastener Co., New York, N.Y.
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Shea Chemical Corp., Baltimore, Md.
Shell Chemical Corp., Denver, Colo.
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Sherwin-Williams Company, The, Cleveland, Ohio
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THE HISTORICAL CORNER

By BROOKS E. KLEBER*

WILLIAM L. SIBERT, OUR FIRST CHIEF

(Based upon the book, William L. Sibert: The Army Engineer, by Edward B. Clark published in 1930 by Dorrance & Co., Philadelphia, Pa.)

Most of us in the Chemical Corps think of Major General William L. Sibert primarily as head of the original Chemical Warfare Service. This temporary organization was established in May 1918 to bring some order out of the chaos of five independent agencies working on chemical warfare. Everything in Sibert's previous thirty-four years of military service indicated that he would be successful in his new position. He was. However, if we think of Sibert only in terms of chemical warfare, we run the chance of overlooking his many accomplishments in the Corps of Engineers and later as a general officer.

Sibert was born in northern Alabama and spent the greater part of his youth in Gadsden. He attended the University of Alabama for a short time before entering the United States Military Academy. He was graduated in 1884, finishing seventh in a class of thiry-seven. Sibert's military career took him to the Philippines, the Panama Canal Zone, China, and France. The recurring theme in this career was waterway construction, and he became an expert in this field.

As a lieutenant he supervised the repair of locks on the Green and Barren Rivers in Kentucky. Later he participated in the project on the Great Lakes which increased the channels of the connecting waterways. This work earned him an independent command—the River and Harbor District at Little Rock, Arkansas.

Captain Sibert served in the Philippine Campaign as a company commander and as Chief Engineer of the 8th Army Corps. Returning to the United States, he soon was supervising the improvements on the Alleghany and Monongahela Rivers and on part of the Ohio River. He finished or built dams and locks on all three rivers and he took the lead in a move that was to raise the navigable channel of the upper Ohio from six to nine feet.

This background in waterway construction was instrumental in Major Sibert's appointment to the Isthmian Canal Commission by President Theodore Roosevelt. His job in the Panama project was building the Gatun locks and dam. Although these facilities were expected to take two years longer to complete than any other extensive section of the canal, they were the first to be finished. This was probably the outstanding achievement in Sibert's career.

Lieutenant Colonel Sibert next served in China on a peculiar mission. The American Red Cross was concerned about the frequent floodings of the Huai River, and the consequent famines in that area of China. The Red Cross appointed Sibert as chairman of a board of engineers to make plans for flood control. Unfortunately, the first World War began at about the same time that the plans were submitted and the matter was dropped.

Shortly after Sibert's return from China he was promoted to Brigadier General "in the Line of the Army." Upon our entry into World War I, Sibert received his second star and was given the command of the First Infantry Division, which he trained and took into combat. On 11 May 1918 he received the job for which he is best known by most of us in the Chemical Corps. We are justly proud of him for that work but considering everything he will be best remembered for his career before 1918. Even his biographer calls his book *William L. Sibert: The Army Engineer.*

*Member of the Historical Office, Office of the Chief Chemical Officer.

CHEMICAL PROGRESS WEEK MAY 16-21

The Manufacturing Chemists' Association, Inc. is sponsoring the second annual Chemical Progress Week, May 16-21, 1955. The week was selected to end with National Defense Day on May 21.

The theme of this nation-wide program will be to emphasize the contribution of chemistry and the chemical industry in improving the everyday living of our more than 160 million people.

Chemical Progress Week has the active support of the American Chemical Society, the American Institute of Chemical Engineers, and the Armed Forces Chemical Association. A program even larger than last year has been developed to reach "grass roots" level through speeches, television, radio, plant tours, postage meter slugs, etc.

NOTICE TO MEMBERS!

With new membership cards you will receive an objective card.

If you will show your objective card to your friends you may find they will want to join the A.F.C.A. One who sponsors 10 new members is eligible to receive a plaque as a reward.

You may have more objective cards by writing your:

Secretary-Treasurer